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ENERGY AND WATER DEVELOPMENT APPROPRIATIONS FOR FISCAL YEAR 1990

HEARINGS

BEFORE A

SUBCOMMITTEE OF THE

COMMITTEE ON APPROPRIATIONS

UNITED STATES SENATE

ONE HUNDRED FIRST CONGRESS

FIRST SESSION

ON

H.R. 2696

AN ACT MAKING APPROPRIATIONS FOR ENERGY AND WATER DEVELOPMENT FOR THE FISCAL YEAR ENDING SEPTEMBER 30, 1990, AND FOR OTHER PURPOSES

PART 1 (Pages 1-343)

DEPARTMENT OF THE ARMY
Corps of Engineers—Civil
DEPARTMENT OF THE INTERIOR
Bureau of Reclamation
DEPARTMENT OF ENERGY

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ENERGY AND WATER DEVELOPMENT APPROPRIATIONS FOR FISCAL YEAR 1990

WEDNESDAY, MAY 3, 1989

U.S. SENATE,
SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,
Washington, DC.

The subcommittee met at 2:15 p.m., in room SD-192, Dirksen Senate Office Building, Hon. J. Bennett Johnston (chairman) presiding.

Present: Senators Johnston, Byrd, Burdick, DeConcini, Hatfield, McClure, and Cochran.

DEPARTMENT OF THE ARMY

CORPS OF ENGINEERS—CIVIL

STATEMENT OF ROBERT W. PAGE, ASSISTANT SECRETARY OF THE ARMY (CIVIL WORKS)

OPENING REMARKS

Senator JOHNSTON. The hearing will come to order. This afternoon we will receive testimony on the fiscal year 1990 budget. We review today the water resource development programs of the Army Corps of Engineers and we will hear from Assistant Secretary of the Army for Civil Works, Mr. Robert Page, his principal Deputy Assistant Secretary, Mr. John Doyle, along with the Chief of Engineers, Lt. Gen. Henry J. Hatch, and the Director of Civil Works for the Corps, Brig. Gen. Patrick Kelly. In addition, we have Mr. Don Cluff, Chief of the Civil Works Programs Division, normally called the budget officer, who will try to keep all of the numbers straight.

Gentlemen, we welcome you and all of the staff here today to bring the committee up to date on the activities of the Corps. We look forward to hearing your remarks. Before we proceed further I want to call on the distinguished ranking minority member of this committee, former chairman of the subcommittee and the full Appropriations Committee, my good friend and compatriot, Senator Mark Hatfield, for any remarks he may wish to make.

Senator HATFIELD. Thank you, Mr. Chairman. I will defer my formal remarks and get on to the testimony. Thank you, anyway.

Senator JOHNSTON. Senator DeConcini.

Senator DECONCINI. I have no opening remarks. Thank you, Mr. Chairman.

Senator JOHNSTON. Mr. Secretary, you may proceed.

Mr. **Page**. Thank you. I am pleased to be testifying before the subcommittee today on the January 9, 1989, budget proposed for the fiscal year 1990 Civil Works Program of the Army Corps of Engineers.

The Civil Works Program is part of the nondefense, discretionary portion of the residual freeze budget category identified by President Bush on February 9 as subject to negotiation with Congress.

You have already introduced those that are with me at this table and I will certainly be looking to them today for answers to be able to respond to whatever you might wish from us aside from our testimonies. With your permission, Mr. Chairman, I ask that my complete statement, and that of the Chief of Engineers, be included in the record of these hearings.

Senator **Johnston**. Without objection, so ordered.

Mr. **Page**. I will present highlights and ask that the chief also be permitted to highlight his statement.

We are reviewing our fiscal year 1989 and 1990 programs to identify opportunities to more fully reflect the policies of President Bush. For example, we will be participating in the Interagency Wetlands Task Force the President has stated he will establish under the guidance of his domestic policy council. This task force will work toward no net loss of wetlands as a national goal, primarily by strengthening existing Federal programs that protect, maintain and restore the wetlands.

ALASKA OILSPILL

On the Alaska oilspill, we are all concerned about the massive oilspill off the coast of Alaska and the Corps is one of the several agencies involved in that cleanup effort. Seven Corps employees were members of the DOD assessment team that recently went to Alaska to determine what assistance DOD could provide to the Coast Guard in its cleanup operation.

Two Corps dredges, the Yaquina and the Essayons, are participating in the oil skimming operations in Prince William Sound. The Corps dredges are also serving as a base of operation and source of logistical support and assistance in the oil cleanup.

Mr. Chairman, just to deviate slightly from my statement, our latest meeting was yesterday afternoon at the Pentagon, speaking directly with those in charge up at Valdez and we will be happy to bring you up to date if you so desire—you or the committee—during this testimony, of the latest development.

PRESIDENT'S FISCAL YEAR 1990 BUDGET

The proposed fiscal year 1990 budget is a good budget for the Civil Works Program and it totals $3.4 billion. This includes $3.18 billion in Federal funds and $223 million in non-Federal contributions. These non-Federal cash contributions are supplemented by provisions of lands, easements, rights-of-ways, and relocations which are estimated at $230 million.

The Federal amount includes $2.90 billion in general Treasury appropriations and $283 million from two trust funds: $119 million from the Inland Waterways Trust Fund and $164 million from the Harbor Maintenance Trust Fund.

A substantial new starts program both in construction and in studies is provided for and is responsive to the need to invest in essential flood control and navigation.

NEW CONSTRUCTION STARTS

The fiscal year 1990 budget demonstrates the administration's continuing commitment to sustaining needed water resource development and management of the Nation based on the cost-sharing reforms authorized in the Water Resources Development Act of 1986, Public Law 99-662, by providing funding for 11 new start construction projects.

Six of the 11 new starts were previously recommended in the fiscal year 1989 budget and we reaffirm our strong support for the new starts. The total investment represented by these projects was estimated in the January 9 budget to be $2.01 billion.

The cost estimates for the 11 new starts plus the Bonneville Navigation Lock project are being converted to a new code of accounts. It is the initial phase of a program to convert all estimates under the new program started last year, entitled, Initiatives '88. I think we spoke to you during our last year's testimony about that program.

At present, three projects—the Sims Bayou and the Ramapo and the Mahwah Rivers projects, which are new starts and the Bonneville Navigation Lock project—have been identified as having cost increases which put them over their respective section 902 caps. As soon as we confirm these increases we will furnish the new information. That should be in the very near future.

WATER MANAGEMENT DURING DROUGHT STUDY

One proposed new study will merit special attention, a study of water management during drought. The Corps played a significant role in mitigating adverse impacts of the recent drought in the Nation's heartland. With the benefit of this experience we propose to initiate a multiyear study of alternate ways and means to manage the Nation's water resources, both short and long term in order to better deal with droughts.

CONSTRUCTION PRODUCTIVITY ADVANCEMENT RESEARCH PROGRAM

The fiscal year 1990 budget includes $4 million for the newly authorized CPAR program and I want to acknowledge the concurrence by the subcommittee in the increase in the fiscal year 1989 R&D funding allocation to accommodate the CPAR program.

The subject of R&D on industrial productivity has gotten a lot of action attention lately in the press. With your permission, Mr. Chairman, we would like to include for the record a few of the articles and letters most relevant to CPAR, including the chairman's article in the January 8, 1989, New York Times concerning cost-sharing and R&D, particularly as it relates to the military programs. I believe that was a very fine letter which was submitted to the New York Times.

There is a common thread among these articles. The United States is losing its competitive edge at least in part because we have neglected research and development, the spawning ground for productivity increases. The articles also stress the need for public and private joint ventures. Research under this initiative is expected to pay large dividends. It will focus on ways to improve design, construction technology and equipment, materials and technology transfer management. We expect this program to be operational by early summer.

SMALL HARBOR AND RECREATION FACILITIES FUNDING REDUCTION

The January 9 budget contained two proposals for the operation and maintenance program which have generated controversy and adverse congressional reaction. I refer to the proposed recreation closures and the navigation reductions.

In my February 3, 1989, letter, Mr. Chairman, I informed you and members of the subcommittee that we were committed to seeking alternate means of realizing the necessary O&M reductions. Since that time the Corps of Engineers has been taking a closer look at the proposed recreation closures and navigation cuts.

These reviews reveal that some of the effects of the spending reductions can be mitigated by spreading the cut across the board in the O&M account through unavoidable deferral of maintenance in order to achieve some comparable savings.

Throughout the budget year divisions will institute intensive management action to reduce adverse consequences.

At this time, the divisions and district commanders of the Corps are concluding their own reviews. When that process is completed, as I mentioned in my letter of yesterday, we will provide the subcommittee with a revised O&M proposal by division for your further consideration and decision.

DREDGED MATERIAL DISPOSAL

Beyond the question of how much of the Corps' O&M budget ought to be allocated to operation and maintenance of recreation areas and certain navigation projects, there has emerged another pressing issue that threatens the integrity of the O&M budget, and I refer to the possibility which is raised in the case of Oakland Harbor and other projects of requiring disposal of dredged material far off shore in the ocean. The significant increases in O&M cost that such a requirement would necessitate if imposed nationally, or even regionally, might be of concern to all who, like this subcommittee, bear responsibility for the O&M budget.

Senator JOHNSTON. Is that a court requirement?

Mr. PAGE. This is Corps.

Senator JOHNSTON. C-o-u-r-t? Are you requiring yourself to do it?

Mr. PAGE. Yes, we are requiring ourselves to do it.

General HATCH. Sir, it is also a result of our coordination with our resource agencies. If you will, it is sort of a joint decision that is arising out of the environmental reviews associated with the disposal of that material closer to where it has been excavated, such as in estuaries, in harbor areas——

Senator JOHNSTON. It sounds like from your statement that you are complaining about it, but you are imposing it on yourself.

OAKLAND HARBOR, CA, DEEPENING

Mr. PAGE. I could explain by giving you a little bit of background as it relates strictly to Oakland. The Oakland project, which has been under study for quite some time, had two different areas that required dredged material disposal sites. Our first site, selected in concurrence with EPA, was later rejected and therefore we were left with a problem of disposing of a large amount of dredged material in deepening the harbor in Oakland.

The Oakland partners came to us—our cost-sharing partners—with a proposal that could be a solution and that would be taking that dredged material 75—65 to 70 miles, or 75 miles—off shore. That we have to study. We are looking at that, because if the initial cost is borne by them, of taking it off, it still is a very viable project for them.

It has very little impact upon their cost-benefit ratio. But for us to continue to do that, we have to maintain that and we will be doing it each year and the cost of ongoing maintenance not only at Oakland but also others—there are probably five or six other harbors in that area——

IMPACT ON O&M BUDGET

Senator JOHNSTON. What I am getting at is, you indicate that this is a pressing issue that threatens the integrity of the O&M budget and must be of concern to all, like this committee. If it is such a big concern, why are you doing it?

Mr. PAGE. It is a concern that we have to do it. I think we have to do that.

Senator JOHNSTON. Why should it be of concern?

Mr. PAGE. Because it is going to increase our O&M budget.

Senator JOHNSTON. You say it threatens the integrity of your O&M budget. Are you saying you do not want to have to do it, or you want to have to do it and you want more money?

Mr. PAGE. We are not asking at this time, or do we expect that we are going to be able to get more money. If this is a burden upon us over and above what we have anticipated for that O&M budget then it will be serious—it will jeopardize our budget. So we are saying we have to come to grips with this problem, find another way, otherwise I am afraid that we are going to get into a situation with the O&M budget where we are going to be mortgaging the future.

Senator JOHNSTON. You are going to be closing down harbors?

Mr. PAGE. I do not know whether we will be closing——

Senator JOHNSTON. If you do not have the money to dredge——

Mr. PAGE. Closing down harbors or finding a way that the owners, that the operators will be doing that dredging themselves later, at a later date rather than imposing upon the Federal Government.

DUMP SITE SELECTION PROCESS

Mr. DOYLE. I would add a couple of thoughts. When we dispose of dredged material in water, and particularly in the ocean, we can only do so in sites that have been approved to receive the material by the Environmental Protection Agency.

That site designation and approval process takes place pursuant to the Ocean Dumping Act, which requires that certain criteria be met and procedures be followed before a site can be designated and used. We thought we had such a site in Oakland. At the last minute access to that site was prevented by a local lawsuit.

In Oakland, that has left us without an approved ocean disposal site to receive the materials that we have and that, at least in the near term, is going to drive us farther out into the ocean until sites can be identified and approved.

That is a multiyear process, so it is not strictly the Corps of Engineers imposing this procedure on itself. We have to follow procedures established pursuant to law and regulation by the Environmental Protection Agency.

Mr. PAGE. Does that answer it? We are on the question of how much of the Corps' O&M budget should be allocated to operation and maintenance of recreation areas and certain navigation projects.

There has emerged another pressing issue, that is the integrity of the O&M budget, and I am going back now and referring to the Oakland project and picking it up where we were before. Increased cost of far offshore dumping could further limit the Corps' ability to fully maintain the existing harbors of the Nation by making such maintenance work no longer economically justified.

We continue to work with EPA and local interest to find solutions that properly balance economic and environmental considerations.

HOUSTON SHIP CHANNEL, TX

Mr. PAGE. Senator, if I may give you further update, as of last week we are working on a port project in Houston, the Houston Ship Channel, to widen and deepen the channel from Galveston to the Port of Houston. In an informal meeting with EPA, the Port Authority said that it could agree with a solution to take the dredged material offshore. That means possibly 60 to 70 miles offshore. We told the Authority the problem that would exist and how this would impose a burden upon future budgets. That has caused the Authority and EPA to understand the situation. They are meeting together, I believe, tomorrow, to see how we can come to a more reasonable solution without the high cost of taking that material out that far. At least it generates another thinking process that economy is involved in this overall situation and development.

PERFORMING WORK FOR OTHERS

We have had several discussions with the Department of Energy concerning ways the Corps could be of assistance in nuclear related, Superconductor and Super Collider [SSC] construction projects. Secretary Watkins and I have recently established a short-term Corps task force to which the Corps will apply its life cycle project management expertise to assist DOE in developing a management plan for the design and construction for the SSC project.

CONCLUSION

As we stated earlier, this budget provides for significant progress in addressing the Nation's flood control and navigation problems. In putting this budget together, we had to confront difficult choices. The challenge will be with us for some time. I am committed to working with this subcommittee to assure that the final budget which ultimately is enacted represents not only a responsible and responsive allocation of fiscal year 1990 resources, but also charts a sound course for the future civil works program of the Army Corps of Engineers.

Mr. Chairman, thank you very much, sir. That concludes my summary.

Senator JOHNSTON. Thank you, Secretary Page.

[The statement follows:]

STATEMENT OF ROBERT W. PAGE

INTRODUCTION

MR. CHAIRMAN AND MEMBERS OF THE SUBCOMMITTEE:

I am pleased to be testifying before the Subcommittee today on the January 9, 1989, budget proposed for the Fiscal Year 1990 Civil Works Program of the Army Corps of Engineers. The Civil Works program is part of the non-defense discretionary portion of the residual freeze budget category, identified by President Bush on February 9 as subject to negotiation with Congress.

Assisting me are the Principal Deputy Assistant Secretary, Mr. John S. Doyle, Jr., the Chief of Engineers, Lieutenant General Henry J. Hatch; the Director of Civil Works, Brigadier General Patrick J. Kelly, and the Chief of the Civil Works Programs Division, Mr. Don Cluff.

We are continuing to review our FY 1989 and FY 1990 programs to identify opportunities to more fully reflect the policies of President Bush. For example, the Army plans to participate in the interagency wetlands task force the President has stated he will establish under the guidance of the Domestic Policy Council. This task force will consider the implementation of no net loss of wetlands as a national goal, primarily by strengthening existing Federal programs that protect, maintain and restore wetlands.

My statement covers the following topics:

- FY 1989 appropriations for the Civil Works program;
- The FY 1990 budget for the Civil Works program;
- The status of ongoing improvements in Civil Works project and program management; and
- Panama Canal Commission oversight responsibilities.

General Hatch's statement complements this one, providing further detail on the FY 1990 budget.

FISCAL YEAR 1989 APPROPRIATIONS

We are pleased with FY 1989 appropriations for the Civil Works program, even though Congress found itself unable to provide construction funding for the six recommended new starts. Appropriations for the Civil Works program were within 102 percent of those for FY 1988 and, thus, were consistent with the 1988 Bipartisan Budget Agreement. Moreover, Congress did fund a strong study program, which is a necessary base for future water resources development.

We are pleased with progress made on implementation of approved new construction starts. Since cost sharing reforms went into effect, Local Cooperation Agreements (LCAs) have been signed with sponsors of 67 specifically authorized projects and 11 separable elements of such projects. These figures do not include six inland navigation new starts, which do not require LCAs. Additional LCAs are scheduled for execution during FY 1989 on projects that received new start construction funding prior to this year, as well as on a number of additional separable elements subject to new cost sharing.

The concurrence of this Subcommittee in the recent authorization of the Construction Productivity Advancement Research (CPAR) initiative also is appreciated, in particular with regard to the provision to increase the FY 1989 research and development (R&D) funding allocation to accommodate CPAR. We expect this new program to be completely operational by early summer. Later in this statement we will discuss in more detail CPAR and our views about its relationship to the larger issue of the productivity of American industry, which we know is of great interest to you personally, Mr. Chairman.

Alaskan Oil Spill

We are all concerned about the massive oil spill off the coast of Alaska, and the Corps is one of several agencies involved in cleanup efforts. Seven Corps employees were members of the Department of Defense (DOD) assessment team that recently went to Alaska to determine what assistance DOD could provide to the Coast Guard in its cleanup operation. Two Corps dredges--the "Yaquina" and the "Essayons"--are participating in oil skimming operations in Prince William

Sound. The Corps dredges also are serving as a base of operations and source of logistical support for other DOD assistance in the oil cleanup.

FY 1989 Supplementals

Before moving on to discuss details of the FY 1990 budget, we would like to mention that we are requesting FY 1989 Supplemental Appropriation transfer authority to move a total of $5.9 million from other accounts to the General Expenses and Regulatory Programs. Two such transfers totaling $3.7 million were proposed in the January 9 budget for the purpose of helping to absorb the FY 1989 pay raise in these labor-intensive accounts. A third proposed transfer would enable the Corps to be more responsive to the President's commitment to protect and preserve wetlands. This $2.2 million proposal would provide funds to: 1) train Corps personnel in the use of the recently approved interagency Wetlands Delineation Manual; 2) increase monitoring and enforcement efforts to improve compliance with permit conditions; and 3) to initiate efforts to improve the Corps capability to reach technically sound permit decisions with regard to wetlands alteration and mitigation. In addition to these changes, each Corps appropriation account would be affected by the 1.09 percent across-the-board reduction the President has proposed to help fund requested supplemental appropriations for other agencies' programs.

PRESIDENT'S FISCAL YEAR 1990 BUDGET

The proposed FY 1990 budget for the Civil Works program totals $3.40 billion. This includes $3.18 billion in Federal funds and $223 million in non-Federal contributions. These non-Federal cash contributions are supplemented by provision of lands, easements, rights-of-way and relocations, which are estimated at $230 million. The Federal amount includes $2.90 billion in general treasury appropriations and $283 million from two trust funds -- $119 million from the Inland Waterways Trust Fund and $164 million from the Harbor Maintenance Trust Fund. The general treasury amount will be offset by over $21 million in receipts from currently authorized recreation user fees, payments for lease of Federal lands, and hydraulic mining debris disposal fees. Table A, which is attached, summarizes the FY 1990 budget by appropriation title.

This is a good budget for the Civil Works program. The budget provides for a substantial new starts program, both in construction and in studies, and is responsive to the need to invest in essential flood control and navigation. Difficult choices could not be avoided and, as we shall address later in this statement, neither could controversy. I do hope nevertheless that, working together with this Subcommittee, we can arrive at a responsible and responsive allocation of the limited resources that will be available in FY 1990 for the Civil Works program of the Corps of Engineers.

New Construction Starts

The January 9 budget proposed funding 11 new start construction projects. Although the entire Civil Works program is subject to negotiation between President Bush and Congress, the Army continues its strong support for new starts in the FY 1990 budget. We trust that implementation of these sound projects will be confirmed through the continuing budget negotiations.

The 11 new construction starts in the FY 1990 budget include 10 under the Construction, General, program and 1--Nonconnah Creek--under the Flood Control, Mississippi River and Tributaries (MR&T) program. The total investment represented by these projects was estimated in the January 9 budget to be $2.01 billion. The Federal and non-Federal shares of this investment was $1.55 billion and $454 million, or 77 and 23 percent, respectively. The Federal amount includes $140 million from the Inland Waterways Trust Fund to finance 50 percent of the cost of two new Inland Waterways projects. If these funds counted as part of the non-Federal share, they would raise the total non-Federal contribution to approximately 30 percent. The FY 1990 budget provides $86 million to initiate these new projects, including $19 from the Inland Waterways Trust Fund. Table B, attached, presents the financial information by project as of January 9. As mentioned later in this statement, we are developing new project estimates for the new starts and are reviewing the cost growth limitations imposed by Section 902 of Public Law 99-662 on the Corps ability to proceed without further authorization.

Six of the 11 new starts were previously recommended in the FY 1989 budget, and we reaffirm our strong support for them. The remaining 5 have highest priority among all other current candidates, based on return on the investment in navigation and flood control.

Water Management During Drought

One proposed new study merits special attention here--a study of Water Management During Drought. The Corps played a significant role in mitigating adverse impacts of the recent drought in the Nation's heartland. The Inland Waterways Users Board attests to this in its Second Annual Report to the Secretary of the Army and the United States Congress, stating:

> "Through responsive action on the part of the U.S. Coast Guard, the barge industry and its industry groups, and the Corps, what could have been an uncontrollable, serious operating disaster turned into a controllable, serious operating problem. Much of the credit for alleviating the worst of the situation goes to the Corps...who, through almost continuous dredging and judicious management of water flows, limited the scope of the problem."

Throughout our experience during the 1988 drought, we enjoyed a productive partnership with other agencies, such as the Coast Guard, and with the private sector--for example, the American Waterway Operators--who worked with us to minimize the impact of the drought on American industry.

With the benefit of this experience, we propose to initiate a multi-year study of alternative ways and means to manage the Nation's water resources, both short- and long-term, in order to better deal with droughts. The primary purposes would be to develop a consensus on regional and national water management priorities in drought situations and to provide a base of information enabling us to formulate alternatives for improved management of the Corps system of projects during droughts. The budget provides $500,000 for the first phase of this study. Each year we will reevaluate whether the study should be continued.

Let me add at this point that, with a couple of critical months of weather yet to be experienced, it is premature to forecast whether dry conditions will continue to affect rivers and reservoirs during the coming summer. In his statement, General Hatch will provide more information on steps the Corps is taking now to put us in the best possible position in the event the drought persists.

Other New Planning

There are 62 other new planning starts, of which 61 are under the General Investigations program and 1 is under the MR&T program. Thirty of the 62 are reconnaissance investigations, and 32 are preconstruction engineering and design (PED) efforts, one of which--Whiteman's Creek, Arkansas--is under the MR&T program. The budget provides $9.2 million and $11.8 million respectively for these two categories of planning. The reconnaissance studies are fully funded in FY 1990. Total investment in the new PED efforts is estimated to be $52 million over a period of several years. We believe that the proposed reconnaissance studies will result in identification of economically feasible solutions, implementable under Federal rules, with non-Federal sponsors to participate in follow-on feasibility studies. In addition to the 32 PED new starts, 10 cost shared feasibility studies are expected to proceed into the PED phase during FY 1990.

Construction Productivity Advancement Research

The FY 1990 budget includes $4 million for the newly authorized CPAR program, which I mentioned earlier. The subject of R&D on industrial productivity has gotten a lot of attention lately in the press. With your permission, Mr. Chairman, we would like to submit for the record a few of the articles most relevant to CPAR. From the November 16, 1988, Wall Street Journal, an article entitled "Eroding R&D: Slow Rise in Outlays for Research Imperils U.S. Competitive Edge"; from December 27, 1988, Wall Street Journal, a letter we sent in response to the November article; and from January 8, 1989, New York Times, your article, Mr. Chairman, concerning cost sharing of R&D, particularly as it relates to military programs.

There is a common thread among these articles: the U.S. is losing its competitive edge at least in part because we have neglected R&D--the spawning ground for productivity increases. The articles also stress the need for public/private joint ventures. CPAR was conceived to accomplish exactly what many spokesmen now say is critically needed.

The American construction industry is very interested in CPAR. The Corps initially received expressions of interest and support from more than 400 construction industry companies and related organizations. We met with industry representatives several times over the past year and, frankly, even I was surprised at the strength of their response, and I already knew CPAR was a good idea--an idea whose time had come.

We would like to submit for the record letters from two Governors--Governor Cowper of Alaska and Governor Thompson of Illinois--indicating their interest in CPAR and, in the case of Governor Cowper, his enthusiastic endorsement of the goals we have established for CPAR.

The Corps has set up a management process to assure wise and proper use of CPAR funds. The Research and Development Directorate will review all CPAR proposals recommended by the Corps laboratories. Then, later this month, the CPAR Executive Committee, composed of senior management officials of Corps Headquarters, is scheduled to recommend those to be undertaken. In June, we plan to inform this Committee of our intent to implement those proposals which ultimately are approved. Each of these cost shared proposals will be fully funded at its outset.

The CPAR R&D will focus on ways to improve design, construction technology and equipment, materials, and technology transfer management. This is expected to pay large dividends, not only to the Corps and participating private industry, but also to the Nation at large through greater productivity and, thereby, a sharpened competitive edge in world-wide engineering and construction.

Reevaluation of Operation and Maintenance (O&M) Program

The January 9 budget contained two proposals for the operation and maintenance (O&M) program which have generated controversy and adverse Congressional reaction. These were:

> The proposed reduction of $34 million below the amount necessary for the Corps of Engineers to operate and maintain all of its recreation areas, which would result in closure or partial closure in FY 1990 of some 25 percent of Corps recreation areas; and

> The proposed reduction of $49 million below the amount necessary for the Corps of Engineers to maintain all of its authorized navigation projects at a level consistent with current traffic demands. This reduction was accompanied by a policy decision that required the Army to cease maintenance of recreational and low-use commercial harbors.

In my February 3, 1989, letter, Mr. Chairman, I informed you and the Members of this Subcommittee that we were committed to seeking alternative means of realizing the necessary O&M reductions.

Since that time, the Corps of Engineers has been taking a closer look at the proposed recreation closures and navigation cuts. These reviews reveal that some of the effects of the spending reductions can be mitigated by spreading the cut across-the-board in the O&M account, in order to achieve comparable savings. The overall approach which the Corps is pursuing involves:

> Implementation, across-the-board in the O&M account, of a combination of intensive management actions and deferral of maintenance to achieve the required budget savings in FY 1990;

> Adoption of revised criteria for evaluating the FY 1990 O&M program which will reduce to only the most compelling cases the number of recreation closures and harbors that would not be maintained; and

> Seeking a broad range of measures to maintain service levels that do not rely on Corps funds and manpower.

At this time, division and district commanders of the Corps are concluding their own reviews. When that process is completed, we will provide this Subcommittee with a revised O&M proposal, by division, for your further consideration and decision.

This experience has convinced me that we should further pursue O&M of existing facilities by State and local governments and the private sector, consolidate areas to reduce costs, and even consider leasing for some forms of residential development where it can contribute to continued O&M of recreation facilities.

Our FY 1990 budget proposes, for example, a Recreation Partnership Initiative, by which we will pursue opportunities for non-Federal public and private entities to develop additional recreation facilities at existing projects. This could include expansion and taking over the operation and maintenance of existing Corps operated areas and, thus, could reduce Federal funding requirements in FY 1990 and beyond. In addition, we are developing a legislative proposal to provide explicit authority to enter into agreements with non-Federal public and private interests to accept funds, material and services for recreation and natural resources management at project where O&M currently are undertaken completely at Federal expense. This proposal is currently undergoing final Administration review, and we hope to submit it shortly.

Beyond the question of how much of the Corps O&M budget ought to be allocated to operation and maintenance of recreation areas and certain navigation projects, there has emerged another pressing issue that threatens the integrity of the O&M budget. I refer to the possibility, which is raised in the case of Oakland Harbor and other projects, of requiring disposal of dredged material far offshore in the ocean. The significant increases in O&M costs that such a requirement would necessitate, if imposed nationally or even regionally, must be of concern to all who, like this Subcommittee, bear responsibility for the O&M budget. Such increases in costs could further limit the Corps ability to fully maintain the existing harbors of the Nation by making some maintenance no longer economically justified. We continue to work with EPA and local interests to find solutions that properly balance economic and environmental considerations.

Extensions of the Beneficiary Pay Principle

On March 30, 1989, the Administration submitted proposed legislation to remove several restrictions on our ability to collect recreation user fees at day use areas and free campgrounds operated and maintained by the Corps. We are very hopeful that the 101st Congress will be able to act favorably on this proposal. User fees such as we propose have long been a fact of life at State, local and private recreation areas providing comparable services. In fact, such fees often are charged by local governments on lands leased to them at Corps projects. Yet the Corps cannot assess such fees. Increased receipts resulting from enactment of this proposal would be requested in future years to supplement appropriations from general revenues, in the same way that existing Special Recreation Use Fees are handled.

On March 10, 1989, proposed legislation was submitted to extend the beneficiary pay principle--which was strongly defended and reaffirmed by Congress in its recent passage of the 1988 Water Resources Development Act--to two ongoing activities: Planning Assistance to States and Flood Plain Management Services. Under our proposals, receipts would become immediately available to supplement Federal appropriations. We estimate that receipts under proposed legislation, in combination with budgeted Federal funds, would provide program levels close to those being carried out this year.

Through the Planning Assistance to States program, the Corps assists States and territories of the Nation in comprehensive planning for management of water resources. All States, American Samoa, Guam, Northern Mariana Islands, Puerto Rico, Trust Territories of the Pacific Islands, and the Virgin Islands have benefited from such assistance over the years. Recent demand for this assistance has grown substantially. This has significantly increased the cost of the program, which has been borne entirely by the Federal Government. We propose that assistance under this program be cost shared 50/50 with recipients. This will place this program on a financial basis comparable to the feasibility phase of project studies. Reflecting such cost sharing, the FY 1990 budget for the Section 22 program is $2.5 million, which is $2 million below the FY 1989 level.

Through the Flood Plain Management Services program, the Corps provides detailed information on flood hazards, as well as technical assistance on how to deal with them, to other Federal, State, and local land use planners and private developers and homeowners. The program has reduced unwise flood plain development, not only diminishing the risk of future loss of life and property, but also saving costs of disaster relief during and following floods. During FY 1988, 87,000 requests were processed under the program. Because of increasing pressure for development and use of flood plains, demand for program service is growing. So, too, is the cost of the program, all of which, as in the case of the Planning Assistance to States program, has been borne by the Federal Government.

Under the proposed legislation, fees would be established to recover a portion of the cost of responding to requests for technical data and assistance that could be provided from available information to non-Federal public and private entities and individuals. Services to other Federal agencies would be fully reimbursed. More detailed technical studies for non-Federal agencies would be cost shared 50/50. Our goal for this arrangement is to produce receipts of about one-half of the FY 1989 cost of the program. Therefore, the FY 1990 budget requirement is $4.95 million, which is $4.6 million less than the FY 1989 program level.

Transfer of Bridge Program

The budget anticipates passage of proposed legislation to return responsibility for management of the Bridge Administration program from the Coast Guard to the Corps, where it resided prior to establishment of the Department of Transportation. The Administration will resubmit this legislation, which was introduced and passed by the House during the 100th Congress, but not enacted. This program involves issuance of permits for new bridge and causeway construction, operation of drawbridges, and design and construction of alterations to existing bridges to mitigate obstructions to navigation, as authorized under the Truman-Hobbs Bridge Act. The budget provides $6 million and 55 workyears for this program. Funding is included under two programs: $2 million under Construction, General, and $4 million under the Regulatory Program.

Ownership and Operation of Corps Headquarters Aircraft

In order to ensure the most efficient use of the Corps' Headquarters aircraft, we are working on a proposal to transfer operational control and management of the aircraft from the Corps to another Army activity, the Military District of Washington (MDW). MDW would operate the aircraft in conjunction with other Army aircraft in the Washington, D.C. area. Under this concept, MDW would be responsible for all aspects of the aircraft's management, with the Army's Centralized Aviation Support Office assuring compliance with

DOD and Army regulations regarding cost justifications on a per-trip basis. The transfer agreement would provide for use of the aircraft for Corps of Engineers missions.

Other Aspects of the FY 1990 Budget

The FY 1990 budget does not include new funding for the Flood Control and Coastal Emergencies program, which we believe has sufficient carryover to handle situations that reasonably can be anticipated.

A very modest increase was proposed on January 9 in the labor-intensive regulatory program, to cover cost increases over FY 1988 and FY 1989 and to continue timely response to the ever increasing number of permit applications from private developers. We are continuing to review FY 1990 funding and personnel requirements for this program in light of the President's endorsement of a national goal of no net loss of wetlands.

Under Section 902 of the Water Resources Development Act of 1986, Public Law 99-662, project costs, after adjustment for inflation, cannot exceed 120 percent of the authorized cost estimate without first being reauthorized by Congress at the higher cost estimate. We have been reviewing projects to which this limit applies to determine whether or not any of the presently estimated costs exceed the Section 902 limit. While we have not completed the review, we know that some projects exceed the limit and we will be proposing legislation to raise their caps unless we can identify ways to reduce costs by project redesign.

Improved Project and Program Management

In response to the new cost sharing environment, the Corps has embraced several significant management reforms to strengthen our commitment to the delivery of projects within reasonable schedules and at affordable costs. This effort--which last year we called "Initiative 88," and this year we are calling "Focus 89"--is achieving several objectives:

- Streamlining project review and decision procedures;

- Implementing life cycle project management, whereby a single project manager or team will manage a project from conception during the feasibility phase through construction and initial operation, in the interest of more accurate cost estimates and adherence to schedule; and

- Identifying and managing our own cost of doing business to ensure the services provided by the Corps are as efficient as those available in the private sector.

Our goal is to eliminate unnecessary delays associated with the existing review and decision procedures in the planning and design processes. We believe we can reduce by half the average period of time required from initiation of reconnaissance studies to initiation of construction, from an average of 16 years to 8 years. We already have eliminated funding and decision delays between reconnaissance and feasibility phases of studies, as well as between feasibility studies and design efforts, by providing what we call "seamless" funding. As long as a study continues to pass technical and policy tests, and as long as a local sponsor continues to support the study with necessary financing and other commitments, the study continues to receive funding. If a study fails to satisfy technical or policy requirements, or if sponsor support is withdrawn, the study does not proceed to the next phase.

To ensure delivery of quality projects on time and within budget, the Corps is assigning life cycle project managers to all major projects. Large or particularly complex projects are being assigned to individual project managers, who will stay with these projects throughout the planning, design and construction phases. This will assure the continuity essential for proper management, more accurate estimating, and adherence to schedules and budgets and will provide a single point of contact on these projects. A smaller project for which an individual project manager is not justified will be assigned to a management team. Currently, over 300 projects have been assigned to individual project managers or to a management team. By summer, we expect that the number will exceed 400.

Integral to the life cycle project management system is a newly developed code of accounts to provide a uniform basis, throughout the Corps, for estimating and tracking project costs. We are converting, in a phased program, cost estimates for projects to the new code of accounts. The initial set of projects with cost estimates being converted to the new code of accounts will be the 11 proposed new construction starts listed in Table B and the Bonneville Navigation Lock project. I would specifically note, in this connection, that the new start cost estimates shown in Table B and discussed earlier in this statement do not reflect conversion to the new code of accounts, nor the discipline inherent in this new estimating system. At present we have identified three projects--the Sims Bayou, Ramapo and Mahwah Rivers, and Bonneville Navigation Lock projects--as having cost increases which would put them over their respective Section 902 caps. As soon as we confirm these increases, we will furnish the new information. We want the Subcommittee to have the best available project cost estimates for its decisions.

Support for Others

The commitment to efficient project management--making solid cost estimates, delivering projects within the estimates and on schedule, controlling the cost of doing business--increasingly holds the key to provision by the Corps of Engineers of construction management services to other military and civilian Federal agencies. During FY 1988 the Corps provided support to 23 Federal agencies. The Corps' largest Support for Others activity during FY 1988 was support for the Environmental Protection Agency's (EPA's) Superfund and Wastewater Treatment Construction Grants programs. Over the last year, the value of Superfund design and construction assignments received from EPA dramatically increased--from $97 million in FY 1987 to $338 million in FY 1988. We have worked closely with the EPA over the last year to assure that this partnership works to the benefit of both agencies and the Superfund program in general. In addition to performance of this hazardous and toxic waste work for EPA, the Corps, through the Army, is the executive agent for the DOD Environmental Restoration Program, which is the military equivalent of Superfund.

One of the FY 1990 items proposed under the Revolving Fund would primarily support the hazardous and toxic waste program: the completion of renovation efforts on the fourth floor of the Missouri River Division's laboratory, to allow proper chemical quality assurance testing, for our Work for Others activities--both civil and military--as well as any similar analyses that may be needed for our own projects. The Revolving Fund would temporarily finance this renovation of the lab, which is a Plant Replacement and Improvement Program (PRIP) asset, and would be reimbursed over a 5-year period through charges against hazardous and toxic waste and other chemical activities, based on actual use. Due to the importance of completing this renovation, we hope to be able to identify available PRIP resources in FY 1989 to accelerate it.

We have had several discussions with the Department of Energy (DOE) concerning ways the Corps could be of assistance in nuclear-related and Superconducting Supercollider construction. We are interested in providing support on DOE's New Production Reactor program, as well as on radioactive waste cleanup, as a logical extension of the Corps hazardous and toxic waste missions. Also, Secretary Watkins and I recently established a short-term Corps task force through which the Corps will apply its life cycle project management expertise to assist DOE in developing a management plan for design and construction for the Supercollider program.

PANAMA CANAL COMMISSION OVERSIGHT RESPONSIBILITIES

The Panama Canal Act of 1979, Public Law 96-70, in futherance of the Panama Canal Treaty, provides that the Secretary of Defense or his designee is to be a member of the board which supervises the Panama Canal Commission (PCC). I wish to report to this Subcommittee the retirement, effective May 1, 1989, of the Honorable William R. Gianelli, who held this position since 1981, first as the Assistant Secretary of the Army and since 1984 in accord with Public Law 98-354. As a result of a delegation of authority from the Secretary of Defense to the Secretary of the Army, the Assistant Secretary for Civil Works (ASA(CW)), will serve as the designee of the Secretary of Defense on the board of the PCC. The ASA(CW) has thus once again assumed full responsibility of the PCC for the Secretary of the Army. The ASA(CW) will act as the senior defense official involved in the management and operation of the canal.

CONCLUSION

As we stated earlier, the FY 1990 budget provides for significant progress in addressing the Nation's flood control and navigation problems. In putting this budget together we had to confront difficult choices. This challenge will be with us for some time. I am committed to working with this Subcommittee to assure that the final budget which ultimately is enacted represents not only a responsible and responsive allocation of FY 1990 resources, but also charts a sound course for the future Civil Works program of Army Corps of Engineers.

Before I conclude my statement, I would like to add one item not directly related to the FY 1990 budget. Every couple of years, Graduating Engineer magazine conducts a survey of the employer most preferred by graduating civil engineers. In 1985, the Corps ranked second, outvoted only by the Bechtel Corporation. In the 1987 survey, the Corps moved into first place. The two biggest factors influencing the students' votes were reported to be "the nature of the work they would perform and the technical reputation of the organization." We are proud of that reputation.

Mr. Chairman, this completes my statement.

TABLE A

DEPARTMENT OF THE ARMY

CORPS OF ENGINEERS - CIVIL WORKS

FISCAL YEAR 1990 CIVIL WORKS PROGRAM

(Dollars in Thousands)

	FEDERAL FUNDS				NON-FEDERAL FUNDS			
	TRUST FUNDS				RIVERS AND HARBORS CONTRIBUTED FUNDS a/			
APPROPRIATION TITLE	INLAND WATERWAY	HARBOR MAINTENANCE	GENERAL FUNDS	TOTAL FEDERAL BUDGET REQUEST	AUTHORIZED	ANCILLARY	TOTAL	TOTAL PROGRAM FUNDING
GENERAL INVESTIGATIONS	-	-	126,108	126,108	21,000 b/	980	21,980	148,088
CONSTRUCTION, GENERAL	119,000	-	1,082,790	1,201,790	163,000 c/	29,000	192,000	1,393,790
OPERATION AND MAINTENANCE, GENERAL	-	164,000	1,118,622 d/	1,282,622	3,600	2,800	6,400	1,289,022
GENERAL REGULATORY FUNCTIONS	-	-	69,427	69,427	-	-	0	69,427
F.C., MISSISSIPPI RIVER & TRIB'S	-	-	337,000	337,000	2,600 e/	20	2,620	339,620
GENERAL EXPENSES	-	-	128,800	128,800	-	-	0	128,800
REVOLVING FUND	-	-	23,000	23,000	-	-	0	23,000
PERMANENT APPROPRIATIONS	-	-	12,000	12,000	-	-	0	12,000
TOTAL	119,000	164,000	2,897,747	3,180,747	190,200	32,800	223,000	3,403,747
OFFSETTING RECEIPTS:								
UNDER EXISTING LAW			21,100	21,100				
UNDER LEGISLATION TO BE PROPOSED f/		-	20,000	20,000				
NET TOTAL	119,000	164,000	2,856,647	3,139,647				

a/ Authorized - The non-Federal cash contribution required under terms of existing and proposed agreements.
Ancillary - Estimated cost of unauthorized work requested by non-Federal interests and done on a reimbursable basis.

b/ Includes $7.45 million in contributed funds based on proposed legislation.

c/ In addition, local sponsors will provide in FY 1990 lands, easements, rights-of-way and relocations valued at $226 million.

d/ Includes $20.0 million to be derived from the Special Recreation Use Fee account.

e/ In addition, local sponsors will provide in FY 1990 lands, easements, rights-of-way and relocations valued at $4 million.

f/ The $20.0 million anticipated to be derived from proposed increased recreation use fee legislation would be available for use, starting in FY 1991 if enacted by the start of FY 1990.

TABLE B
DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS - CIVIL WORKS
FISCAL YEAR 1990 CIVIL WORKS PROGRAM
NEW CONSTRUCTION STARTS
(Dollars in Thousands)

APPROPRIATION AND PROJECT NAME	STATE	BUDGET REQUEST	TOTAL FIRST COST	FINANCING	
				FEDERAL	NON-FEDERAL
CONSTRUCTION, GENERAL					
* CACHE CREEK SETTLING BASIN	CA	5,500	21,900	16,200	5,700
* SANTA ANA RIVER MAINSTEM	CA	20,000	1,382,000	1,018,000	364,000
* RAMAPO AND MAHWAH RIVERS, MAHWAH, NJ AND SUFFERN, NY	NJ & NY	330	8,225	6,160	2,065
SHEYENNE RIVER (HORACE TO WEST FARGO)	ND	1,200	7,600	5,100	2,500
* SHEYENNE RIVER (WEST FARGO/RIVERSIDE)	ND	4,300	23,300	14,900	8,400
NELSONVILLE LPP	OH	2,415	10,560	7,920	2,640
* LOCK HAVEN	PA	7,600	81,600	61,300	20,300
** PT. MARION, L&D 8, MONONGAHELA RIVER	PA & WV	17,900	88,800	88,800	**
SIMS BAYOU AT HOUSTON	TX	4,000	170,000	126,000	44,000
** WINFIELD LOCK AND DAM	WV	20,800	195,000	195,000	**
SUBTOTAL FOR 10 PROJECTS		84,045	1,988,985	1,539,380	449,605
FLOOD CONTROL, MISSISSIPPI RIVER AND TRIBUTARIES					
* NONCONNAH CREEK	TN & MS	1,500	19,000	14,300	4,700
SUBTOTAL FOR 1 PROJECT		1,500	19,000	14,300	4,700
TOTAL FOR 11 PROJECTS		85,545	2,007,985	1,553,680	454,305
AS A PERCENT OF TOTAL FIRST COST			100.00%	77.38%	22.62%

* Previously included in the President's FY 1989 Budget; however, no funds were appropriated for new construction starts that year.

** Part of the Inland Waterway System. One-half of the project cost will be provided by the Inland Waterways Trust Fund.

[From the Wall Street Journal, Nov. 16, 1988]

Eroding R&D

Slow Rise in Outlays For Research Imperils U.S. Competitive Edge

In the Frenzy of Buy-Outs, Many Firms Cut Spending Or Farm the Work Out

The Sarnoff Center Upheaval

By Lindley H. Clark Jr.
And Alfred L. Malabre Jr.
Staff Reporters of The Wall Street Journal

PRINCETON, N.J.—The David Sarnoff Research Center once produced television breakthroughs for RCA ranging from the first successful electron gun used in a receiver to the color system now used throughout the U.S.

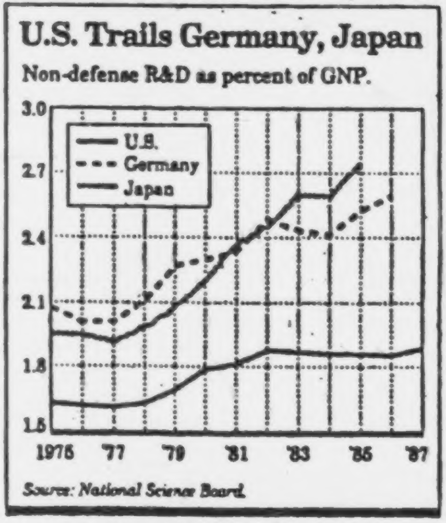
In the past year, however, the center has been making news by announcing cutbacks rather than breakthroughs. It has discharged about 300 people, slashing its employment by 25%.

Few research facilities are trimming sail as severely as Sarnoff, which made the cuts as it was being turned over to SRI International, a nonprofit organization. Overall corporate spending for research and development, in fact, continues to edge up. But the rate of increase has slowed markedly, imperiling U.S. industry's drive to improve its competitive stance in world markets.

John A. Young, president of Hewlett-Packard Co., warns that U.S. industry has "got to expand research and development efforts if it wants to play in this league." In the U.S., he notes, nondefense research and development outlays, as a share of overall economic activity, are running "significantly behind West Germany and Japan, and the gap is steadily growing."

A recent Congressional Budget Office study tracks this troubling pattern. Since 1984, the budget office estimates, inflation-adjusted research and development outlays in private U.S. businesses have risen at an average annual rate of 3%, roughly half the rate of gain in the preceding decade. "Despite the greater competition from foreign firms," the study states, "the portion of gross national product devoted to research and development is lower now than it was 20 years ago."

The slowdown partly reflects the recent frenzied pace of corporate change in the U.S. through acquisitions and restructurings, claims Dennis Maxwell, a vice president of SRI International, a nonprofit research institute based in Menlo Park, Calif. One result, he says, is that "less R&D work is being done by companies in-house, and what's being done is often contracted out."

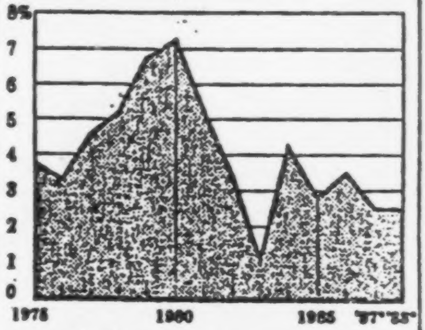

U.S. Trails Germany, Japan

Non-defense R&D as percent of GNP.

Source: National Science Board.

SRI performs such work for an increasing number of corporations, he adds, including the former owner of the Sarnoff center, General Electric Co. GE took over the 350-acre facility when it acquired RCA Corp. in 1986. Soon afterward, GE donated the center to SRI, and the layoffs followed. GE's overall outlays for research and development fell some $300 million last year, to $3 billion.

Kenneth Flamm, an economist at the Brookings Institution, a nonprofit research group in Washington, expresses particular concern over the effect of corporate restructurings on basic research. Because they emphasize near-term results, the restructurings have "clearly contributed to a slowdown in basic research," he contends.



American Research Lags

Real growth rate of R & D spending
(Percentage increase from prior year)

*Projections by Battelle, Inc.

Source: National Science Foundation; Battelle, Inc.

Basic research, which seeks new concepts, is considered crucial to a corporation's long-run prospects. Applied research, which seeks commercial uses for established concepts, tends to benefit a corporation's bottom line much sooner.

Mr. Flamm says only about 3% of research and development outlays now go to basic research, down from 5.4% in 1973. He cites the pattern at Bell Laboratories, which lately has accounted for some 11% of all basic research in the U.S., down from 17% in 1979, just a few years before the court-ordered reorganization of Bell's parent, American Telephone & Telegraph Co. Since then, the economist says, "the emphasis at Bell Labs increasingly is on applying old ideas, not finding new ones."

Bell Labs, however, disagrees with Mr. Flamm's assessment. While Bell Labs is putting more emphasis on developing commercial products from its technology, it is still spending 10% of its budget on basic research. The budget itself has gone from $2 billion in 1983, just before the Bell break-up, to $2.6 billion this year, a Bell Labs spokesman says.

Most of the recent rash of restructuring deals have sharply increased debt-servicing costs of the corporations involved, analysts say, and this has led to a curtailing of outlays in areas such as research and development. Because "R&D has higher risks and longer-term payoffs than most expenditures, it's a highly postponable spending item—a handy target for cost-cutters," says Jerry Jasinowski, chief economist of the National Association of Manufacturers in Washington.

Duracell's Dilemma

Evidence of this squeeze can be seen in a prospectus involving Duracell Inc., recently acquired by Duracell Holdings Corp. in a leveraged buy-out organized by Kohlberg Kravis Roberts & Co. A large battery producer, Duracell is in a field where technological advances are particularly important. Accordingly, the company over the years has depended more heavily than many firms on research efforts.

But the prospectus issued in the buy-out observes that the heavy debt-servicing obligations incurred in the acquisition could hurt the company's "ability to respond adequately to technological developments."

Last year, according to the prospectus, Duracell's research and development outlays totaled $15.4 million, nearly $5 million higher than in 1986. A company spokesman declines to say how much the battery maker plans to spend on R&D this year or next. Such reticence seems to be the order of the day. Officials at some two dozen debt-laden corporations all declined to specify whether the corporate debt was beginning to squeeze research and development expenditures.

Relatively new companies whose growth has lagged behind expectations are scaling down research and development. Stuart Weisbrod, an analyst at Prudential-Bache Securities Inc., says Genentech Inc. still "probably has the best biotech R&D capability in the world." But because of disappointing results of late, Genentech's plans "over the next couple of years call for a reduction in R&D expenditures to 20% to 25% of revenues, down from about 40% now," he says.

According to a Genentech spokeswoman, despite the relative declines as a percentage of revenues, research expenditures "have grown and will continue to increase in absolute terms." She says research spending was $96.5 million in 1987 and will be about $120 million this year. "And in 1989, spending is certain to exceed 1988," although actual amounts haven't yet been budgeted.

Among the U.S. industries facing stiff competition from abroad, the electronics companies are particularly likely to suffer from insufficient research and development spending. Pat Hill Hubbard, an official of the American Electronics Association, a trade group, recently told a congressional committee that the Japanese government and private industry, working together, have spent at least $300 million, and possibly up to $700 million, on home-video R&D–and therefore are "poised to enter today's home-video market with several fine products." The comparable U.S. R&D investment–supplied, he added, by "some 10 private research firms"–totals only about $70 million.

The U.S. government spends heavily on research and development, but economists estimate that 60% of this outlay is for military purposes. This military effort, moreover, engages close to one-third of the nation's engineers and scientists. In countries such as Japan, where military spending plays a much smaller economic role, far more of the research effort benefits private industry.

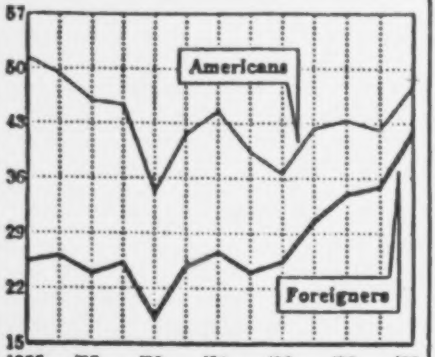
Foreign Inventors' Role

Signs of the lagging of research and development efforts at U.S. businesses abound. "Last year, foreign inventors captured almost half of U.S. patents," says Hewlett-Packard's Mr. Young, who also heads the Council on Competitiveness, a Washington group comprising executives, union leaders and academicians whose aim is to foster a more competitive America. In 1975, by comparison, foreigners captured only one-third of the country's patents. In 1987, for the first time, no U.S. company was among the top three recipients of U.S. patents. All were Japanese: Canon Inc., Hitachi Ltd. and Toshiba

U. S. Patent Trend

Foreigners win a growing share

(In thousands)



Source. U. S. Patent and Trademark Office

At the same time, according to a council report, foreign students account for about 40% of enrollments in U.S. graduate schools of engineering, and they now receive more than half of U.S. doctorates in engineering. "U.S. industrial R&D could not live today without foreign-born scientists and engineers," says Roland W. Schmitt, the president of Rensselaer Polytechnic Institute.

A similar situation prevails at the faculty level. "About one-third of the faculties of our engineering schools are foreign-born," Mr. Schmitt says, and "among younger faculty, assistant professors of engineering under 35 years old, the fraction is now one-half." Moreover, he adds, "there are as many as 1,600 vacancies today in U.S. university engineering faculties, and that's before a heavy wave of faculty retirements that will hit our universities in the mid-1990s."

Ideas for the Government

There is no shortage of ideas for spurring a greater research and development effort in private U.S. businesses. B.R. Inman, chairman of Westmark Systems, a privately owned electronics-industry holding company and a member of the Council on Competitiveness, urges such governmental moves as a higher status in the White House for the national science adviser and a less fragmented approach to R&D financing in Congress.

The Defense Science Board, an independent advisory group drawn from private industry and academia, recently urged the Defense Department to do more to prevent "an increasing loss of technological leadership to both our allies and adversaries."

On the tax front, the R&D investment tax credit was scheduled to expire this year but was recently extended for a year. Still, economists say, uncertainty surrounding the measure's future may be deterring research and development efforts, and they urge that the credit be made permanent.

A few companies have stepped up their research and development outlays. Monsanto Co. devotes 6% to 8% of its revenues to R&D nowadays, up from 3% before the introduction of the R&D tax credit in 1981, reports Nicholas Filippello, chief economist. "We're beginning to see the payoff in new products," he says, citing a new item in the biotechnological area–Bovine Somatatropin–designed to stimulate cows' milk output.

[From the Wall Street Journal, Dec. 27, 1988]

Constructive R&D Blueprint

The page-one article on the reduction in research and development spending by U.S. industry ("Eroding R&D," Nov. 16) clearly defines a major problem that must be solved. While the article focuses on the manufacturing and electronics segments of industry, the U.S. construction industry is also feeling the effects of reduced R&D spending, primarily through loss of leadership in applying advanced technologies and in declining productivity and competitiveness.

The Army Corps of Engineers is in the process of launching a program to help the industry regain its pre-eminent domestic and world position. The Construction Productivity Advancement Research (CPAR) program is a cost-shared partnership among the corps, the construction industry and others interested in advancing construction technology and productivity. The objective of CPAR is to facilitate research, development and application of advanced technologies through cooperative R&D, field demonstration, licensing agreements and other means of technology transfer and reduction to practice.

Not only will CPAR assist the industry in regaining its competitive edge nationally and internationally, it will also reduce the corps' cost of construction by building on the foundation of the corps' existing $250 million annual construction R&D program and laboratory resources through an expansion and leveraging effect that cost-shared partnerships provide. The R&D will address problems and opportunities identified by the industry as well as problems already identified by the corps. The results of the partnership will provide savings in construction costs to government and industry, and provide a boost to the economy in general.

More than 300 construction firms, trade associations, nonprofit groups, professional societies and academic institutions have expressed enthusiastic support for the CPAR initiative. A request for proposals to participate in the first year of the program will be sent out this month with proposals due in February. We expect to have an innovative and highly cost-effective program, and one that could serve as a role model for similar partnership efforts by other segments of U.S. industry.

Robert W. Page
Assistant Secretary of the Army
(Civil Works)
Department of the Army
Washington

[From the New York Times, Jan. 8, 1989]

Make Allies Share Defense

By Bennett Johnston

WASHINGTON

The 101st Congress will likely challenge the Bush administration to spend less overseas to defend our allies and more to defend our own economic future. The alternative is to witness a continued erosion not only in commercial competitiveness but in our military-industrial base as well.

The problem is this: We are allocating an ever-larger share of Federal research and development to defense — defense of our trading partners along with ourselves. This enables our partners to plow proportionately more money into civilian research and development.

Unquestionably, Washington pays more than its fair share of the costs of defending the free world. Defense Department figures show we spend $1,164 per capita on the military, while West Germany spends $454 and Japan only $163. We still pay to keep an overseas force of one million, the majority being civilians and dependents, not troops.

The adverse impact of this burden,

is becoming increasingly evident. Since 1981, Federal spending for civilian research and development has dropped 27 percent in real terms, compared with a 78 percent rise for the military. In the previous 15 years, R & D was split about equally between civilian and military purposes. Today, we spend about half as much on civilian research and development (including NASA) as on military.

Specifically, 69 percent of Federal R & D is now devoted to defense. The corresponding figure for Japan is only 4.5 percent and for West Germany 12.5 percent, according to the National Science Foundation. Moreover, as a percentage of gross national product, Japan and West Germany each spend half again as much as the United States on civilian technology, public and private.

In the past, military technologies spun off a host of civilian products, such as computers, semiconductors and commercial jetliners. But today the spinoff has reversed direction. Commercial technology is now driving military innovation.

Finally, the huge increase in military R & D in the Reagan years went far more into development than into research. Funding for the development of specific weapons increased in real terms by 73 percent between 1981 and 1987. But spending for military research known as "technology base" rose in real terms by a minute 0.3 percent in that period.

How did we reach this point? First, in the budget squeeze on civilian agencies, research and development was an early victim.

Second, Administration spending on R & D has been driven by a narrow ideology of leaving commercial decisions to the marketplace. Generally, if Government-supported research produces a technology with some commercial potential, Administration ideology dictates a cutback. As a result, we tend to produce ideas that other nations, particularly Japan, then develop into such new products as advanced ceramics, fuel cells and photovoltaics. The Bush administration should temper this rigid ideology with common sense.

Perhaps worst of all, a commercial sector that becomes uncompetitive eventually withers away and is unavailable as a military-industrial base. Thus, ironically enough, the Defense Science Board just released a report urging the Defense Department to take a larger lead in rejuvenating the civilian technical base.

While the problem is clear, solutions are more difficult to discern. Without new revenues the Government, especially the Defense Department, can little afford to boost civilian R & D; tax credits to spur corporate research and development have proved difficult to target on vital technologies. And a more militarized Japan is suspect.

However, our trading partners can compensate us more for the defense we provide them. That compensation might help relieve budgetary pressure and enable us to fund civilian R & D at the higher levels, as a percentage of the gross national product that prevailed in the past.

The new administration must restore a balance between civilian and military R & D and more equitably share our defense burden with trading partners whose future competitiveness we now subsidize. Not only trade but our future national security is at stake. □

LETTER FROM STEVE COWPER, GOVENOR, STATE OF ALASKA

March 20, 1989

The Honorable Robert W. Page
Assistant Secretary of the Army
(Civil Works)
The Pentagon
Room 2E569
Washington, DC 20310

Dear Secretary Page:

Over the past months, personnel from the U.S. Army Cold Regions Research and Engineering Laboratory (CRREL), Hanover, New Hampshire, and Fairbanks, Alaska, have met with Dr. Henry Cole, my science advisor, to describe the opportunities presented by the Construction Productivity Advancement Research (CPAR) program that you have sponsored.

I would like to enthusiastically endorse the goals of CPAR that you have established. I have directed Dr. Cole to confer with CRREL personnel and the relevant State groups to work out an agreement which would satisfy the goals of CPAR and the needs of the State of Alaska, Industry and our universities. This agreement would serve as the basis for a long-term construction and research partnership effort involving partners in the State and the Corps of Engineers.

Combining assets and expertise of Federal, State and private sector interests in a CPAR endeavor may well be a most productive way to insure world leadership in the capability to meet future construction challenges in Alaska as well as elsewhere.

Sincerely,

Steve Cowper
Governor

LETTER FROM JAMES R. THOMPSON, GOVERNOR, STATE OF ILLINOIS

March 14, 1989

Mr. Rob Gorham
USAE Construction Engineering Research Laboratory
P.O. Box 4005
Champaign
Illinois 61820-1305

Dear Mr. Gorham:

This letter is to inform you that the State of Illinois plans to submit a full proposal for a Construction Productivity Advancement Research Program Grant. The detailed proposal will be a coordinated effort of the Department of Commerce and Community Affairs, the Department of Transportation, the Department of Energy and Natural Resources and my office.

Illinois has the potential of being a leader in the research and application of innovative construction research. With a solid history of equipment manufacturing and a complex network of Universities, Community colleges and Federal laboratories that have been increasingly working together on technology based activities, we believe that a Construction Productivity Advancement Research program can be develop in the State which will become nationally recognized for its work.

It is the State of Illinois' intent to open discussions with CERL and to develop a full proposal within a timely manner.

I am thanking you in advance for your careful consideration of the Illinois application. If you need further information, please contact Tom Berkshire of my staff.

Respectfully,

James R. Thompson
GOVERNOR

STATEMENT OF LT. GEN. HENRY J. HATCH, CHIEF, U.S. ARMY CORPS OF ENGINEERS

INTRODUCTION

Senator JOHNSTON. General Hatch.

General HATCH. Mr. Chairman and members of the subcommittee, I am honored to be testifying before your subcommittee today on the January 9, 1989, budget proposed for the Army Corps of Engineers Civil Works Program.

My summary statement addresses six topics, fiscal year 1989 emergency responses, programming philosophy, the fiscal year 1990 budget itself, the management program that Mr. Page summarized called Initiative '88, its followon program this year we entitle Focus '89, and our Corps agenda for the future.

FISCAL YEAR 1989 EMERGENCY RESPONSES

Mr. Page has already discussed our involvement in the Alaska oilspill cleanup and last year's drought effort. I would like to provide an update on our drought management program and discuss our recent flood fighting activities.

This year we have already activated our headquarters drought management team and have started monitoring regional conditions in order to be able to respond if drought conditions recur this summer. One action we have taken involves the main stem Missouri River reservoirs where we have reduced both the releases and length of the navigation season on the downstream portion of the Missouri River in order to conserve water.

While we do not anticipate severe drought conditions in most other regions, several of our lakes in the South Atlantic division and in the San Joaquin River basin in the South Pacific division are below full pool. The water supply situation for New York City has improved somewhat due to recent rainfall but remain serious. Stream flows in the New England area are running only 60 to 65 percent of normal for this time of year.

Ironically, while we are monitoring drought conditions, we have also been fighting floods along the Red River of the North in both Minnesota and North Dakota. By providing sandbags and pumps, constructing temporary levees, and raising the pool elevation at several reservoirs to reduce flooding downstream, we have helped prevent over $27 million in damages already this spring.

PROGRAMMING PHILOSOPHY

Turning to programming, our business is to serve the Nation's pressing flood control and navigation needs. As you well know, our projects begin with the reconnaissance studies, and provided they are worthy, proceed through design, construction, and operation and maintenance stages.

Reconnaissance studies uncover possible solutions. Preconstruction engineering design, or PED as we call it, provide the blueprints, construction provides the facilities and operation and maintenance, insures the intended benefits of those facilities are realized by our Nation.

In order to meet demands for needed projects we must insure a balanced program. That is to say we must maintain a steady and sufficient flow of reconnaissance and PED studies to support an adequate construction program. Our fiscal year 1990 budget is based on that philosophy.

FISCAL YEAR 1990 BUDGET

Turning to that budget itself, as the Assistant Secretary has already testified, this budget is responsive and responsible. It provides for needed studies, projects, and services, while judiciously foregoing less urgent services to accommodate the more pressing ones. The budget totaling $3.4 billion includes $223 million, or 6.6 percent, in non-Federal contributions from project sponsors.

The budget provides $147 million for the general investigations, or study, program, including $126 million in requested appropriations, and $21 million in non-Federal contributions based on cost sharing agreements expected to be in place by that fiscal year. It includes $9.2 million for 31 new reconnaissance studies; $11 million for 31 new PED studies; $2.8 million to proceed with 10 PED studies following cost shared feasibility studies, and $4 million for the very important Construction Productivity Advancement Research Program discussed by the Assistant Secretary.

It provides $1.4 billion for the construction general program, including $1.1 billion in general funds; $119 million from the Inland Waterways Trust Fund, and $163 million in projected non-Federal contributions based on cost sharing agreements. It includes $84 million, including $19.1 million from the Inland Waterways Trust Fund to initiate construction of 10 projects. It also includes $24 million to initiate construction under the continuing authorities program, and $8.6 million for other new work.

The budget includes almost $1.3 billion for the operations and maintenance, or O&M, general program, including $164 million from the Harbor Maintenance Trust Fund, and $20 million from Special Recreation Use Fees. This is about $88.1 million, or 6.4 percent smaller than the fiscal year 1989 appropriation for that same O&M program. Nevertheless, it is sufficient to fund operations and maintenance of most projects at levels which will assure continued realization of authorized project benefits during the fiscal year.

Finally, it provides $571 million for six other programs including $337 million for the Flood Control Mississippi River and Tributaries project. This amount includes some $1.85 million for two new construction starts, Whiteman's Creek and Nonconnah Creek projects.

INITIATIVE '88 IN RETROSPECT

Now a quick review of the Initiative '88 program that Secretary Page mentioned—I want to share my enthusiasm for it and provide some context for discussing its followon program, Focus '89.

Our principal Corps goal last year was to improve efficiency and effectiveness of our operations. As explained by the Secretary, this goal was pursued diligently as part of a Corps-wide effort we called Initiative '88. This effort has produced significant results, the three most salient of which are these:

First, through simplification of approval procedures and the elimination of associated delays in the Corps' planning and design processes, we expect to cut in half the time required from initiation of reconnaissance studies to the initiation of construction. Cost sharing provisions of the Water Resource Development Acts of 1986 and 1988 requiring considerable contributions by local sponsors has significantly changed and simplified our method of determining whether continuing projects is justified. Under new procedures for strict cost control, once we commit to projects during the feasibility phase, if local sponsor continue to support them financially, we will proceed rapidly to construction. Additionally, recently we established a Washington Level Review Center and staffed it with advisors from the Board of Engineers to Rivers and Harbors to accelerate projects while maintaining quality. Mr. Chairman, in the past we would take well in excess of a year in reviewing projects here in Washington going through a sequential review process on at least three levels. Now, we combine that review into one Washington Level Review Center and do it all at one time.

Second, as part of the Initiative '88 program, to assure optimal performance under the streamlined planning and design process, we are assigning all projects to some form of life cycle project management—either individual managers, or management teams who will manage them from conception through construction. These project managers and management teams will insure the projects are done within authorized costs and schedules. By this summer we expect to have 400 of them on the job reassigned from within our organization's resources.

Last, but not least, as discussed at some length by the Secretary, we are about to launch the CPAR program with hearty support from the Nation's industry, academia, and others. We are now evaluating some 145 proposals that we have received and hope to finish that review for selecting those that we would tackle this fiscal year within the next month. Research under this program is expected to pay large dividends, not only to the Corps but to the participating private industry as well, and, in fact, to the Nation at large through greater productivity and thereby sharpened competitive edges in worldwide engineering and construction.

FOCUS '89

After Initiative '88 we turned to a new program this year called Focus '89. It continues the success of Initiative '88 with special attention to opportunities to better synthesize the operations of our military and civil programs in order to achieve a more efficient, effective, and productive Corps. This led to the identification of six particular focal points including three, focus on the cost of doing business, life cycle project management, and the construction productivity advancement research, which were elements of last year's program. Of the remaining three, one pertains exclusively to the military program. One of them I might mention is that we are reorganizing our headquarters. That will be accomplished to provide a more workable configuration for project and program management of our main programs. Cost estimating and management practices will be improved to insure that we estimate as accurately as possible, as early as possible during a project's life cycle.

Finally, new missions are being explored, as the Secretary indicated, with the Department of Energy and others with a view to participating more in meeting our Nation's growing needs for engineering services.

FUTURE VISION OF THE CORPS

My last topic would be our ongoing agenda for the future of the Corps. Last fall Corps leaders met two different times and formulated what we have termed a vision for the Corps of Engineers. I would like to summarize that very briefly.

We acknowledge that our purpose is to provide quality, responsive engineering service to the Nation in peace and in war. For more than 200 years we have effectively and proudly responded to changing civil and defense needs. We must be prepared to continue to respond to changing needs and environments. To remain the best we must work hard together to make ourselves better, both individually and as a team—a team with shared values and loyalties and dedicated to common goals and priorities in serving our customers and each other.

We give equal priority to our customers and partners in our mission areas, be they civil or military. While functions in projects from time to time do receive special attention within each mission area, there are no low priority missions. All share equally in our dedication, and to the fullest extent practicable, our resources.

We continually explore and use new and better ways to do our job, particularly in contracting and financing of projects. We standardize design as much as feasible, and tailor construction standards to better accommodate our customers' needs and resources. We believe we are making the Corps more effective by clarifying our roles at all levels and decentralizing execution under appropriate guidance and control with emphasis on individual project monitoring by our headquarters.

We are forging new partnerships and assuring that cost sharing is working.

Since becoming the Commander of the Corps, Mr. Chairman, I have discussed the Corps' current and future service to America with over 1,000 members of our Corps team at all levels, and this brief statement of our ongoing agenda reflects those discussions but is only an outline needing much elaboration by us. We are committed not only to providing this but, more importantly, to reducing it to practice in order to better serve our great Nation. We are looking forward to working with you to that end.

Sir, that concludes my summary.

Senator JOHNSTON. Thank you very much.

[The statement follows:]

STATEMENT OF LT. GEN. H.J. HATCH

INTRODUCTION

I am pleased to be testifying to your subcommittee today, along with the Assistant Secretary of the Army for Civil Works, Mr. Robert W. Page, on the January 9, 1989 Budget proposed for the Army Corps of Engineers' Civil Works Program.

I have appeared before your subcommittee on numerous occasions over the years in support of a sound and productive Civil Works Program to meet the Nation's water resources development and management needs. I am proud of my long association with the program, which began in 1974 in Nashville, Tennessee, where I served as Commander of the Nashville District. Since then, I have been associated with the Civil Works program as Commander of the Pacific Ocean Division, Director of Civil Works, and, since June 1988, as Chief of Engineers. Thanks to this subcommittee's support, the Civil Works Program is now much stronger and better balanced then it was just five years ago. I look forward to your continued support and furtherance of our partnership in prosecuting this program and providing its many significant benefits to the Nation.

FISCAL YEAR 1989 EMERGENCY RESPONSES

Mr. Page has already discussed our involvement in the Alaska oil spill clean-up and last year's drought effort. I would like to provide an update on our drought management program and discuss our ongoing flood fighting activities. We have activated our Headquarters drought management team and have started monitoring regional conditions throughout the Nation in order that we may be ready to respond if drought conditions occur again this summer. We have met with the navigation industry, recreational interests, and the power interests to be certain that we will have a coordinated effort nationwide. A good example of these efforts involves the mainstem Missouri River reservoirs, where we have reduced both the releases and the navigation season on the downstream portion of the Missouri River in an effort to conserve water. I should point out that while we do not necessarily anticipate severe drought conditions in most other regions, several lakes in the South Atlantic division are below full pool and the water supply situation for New York City remains serious but has improved somewhat due to recent rainfall.

Ironically, while we are monitoring drought conditions, we also have been fighting floods along the Red River of the North, in both Minnesota and North Dakota. We provided sandbags, pumps and personnel to aid in the floodfight and have raised the pool elevation at several reservoirs to reduce flooding downstream. Preliminary estimates indicate damages exceeding $12 million and damages prevented exceeding $38 million.

FY 1990 PRESIDENT'S BUDGET BY APPROPRIATION TITLE

OVERVIEW

As Mr. Page has indicated, this budget reflects some hard management decisions. We have had to balance the need for a constrained budget against the commitments to our cost sharing partners for continued development. We think the budgeted program is well balanced; it provides sufficient study, engineering and design, and construction new starts while assuring that all higher priority ongoing programs and activities are adequately funded. All of this is in addition to the proposed reassignment of the regulatory oversight of bridges that cross the Nation's navigable streams from the Coast Guard.

The budgeted program totals $3.37 billion. Fourteen percent or $473 million of the budgeted program will be funded either by contributions ($190 million) from the study and project sponsors or from receipts ($283 million) from established trust funds. This does not include $33 million for work normally requested by non-Federal interests and done on a reimbursable basis. Table A, attached, compares, by individual accounts, the FY 1990 budget with the FY 1988 and FY 1989 appropriations.

Of the FY 1990 request for $3.18 billion in Federal appropriations, some $124 million or almost four percent is included for new starts, of which $103 million is for initiation of construction of specifically authorized projects and those implemented under our Continuing Authorities program. The

FY 1989 appropriations did not include any funds for construction starts. However, it was the need for constraint and holding the budget to a level of about two percent below the FY 1989 Appropriations that required us to reassess the priority and extent to which various programs and activities were to be funded. Since Mr. Page has discussed the new starts, I will address the extent to which the major programs and activities in the key appropriation accounts were funded and what adjustments were made in order to maintain our responsiveness to the plans and schedules of our study and project sponsors.

GENERAL INVESTIGATIONS

The budget provides $126 million for the General Investigations program. In addition, another 17 percent or about $21 million is expected in contributions from non-Federal interests based on cost-sharing agreements and procedures expected to be in effect by FY 1990. About $13.6 million in matching funds are required for the feasibility studies programmed in FY 1990. An additional $7.4 million in non-Federal contributions would be available if legislative proposals requiring matching funds for the Planning Assistance to States and the Flood Plain Management Services programs are enacted. These proposals reflect an extension of the beneficiary-pay principle which already is being applied to various programs in this and other appropriation accounts.

Major emphasis in this account has been to achieve a study and design program that provides for an orderly and steady flow of needed projects from reconnaissance and feasibility studies through preconstruction engineering and design (PED) to the construction program. Accordingly, some $90 million or 72 percent of the request for this account is for the studies and PED programs. Of the $90 million almost 26 percent or $23.5 million is for new starts in the two program categories including 10 PED projects which are being funded as follow-on to cost shared Feasibility phase studies. Another 20 percent or $25.5 million in the account is for continuing our Research and Development program. It is through this program that we are able to overcome technology shortfalls and, as we have stressed, replace outdated methods and techniques. By striving for improved technological competence and innovation, we also become a more reputable cost-sharing partner to the sponsors of our projects.

CONSTRUCTION, GENERAL

The budget provides $1.2 billion, including $119 million from the Inland Waterways Trust Fund, for the Construction, General, program. In addition, we will require $163 million in contributions from non-Federal interests based on cost sharing agreements expected to be in effect in FY 1990.

Program emphasis under this account was to resume the funding of new construction starts, given the expected build up of projects that have priority outputs and for which the preconstruction engineering and design has been or is scheduled to be completed. However, even with the recommended new starts, the construction budget is only some $17 million more than funded in FY 1989. This is attributable to the fact that construction of some 22 ongoing projects is programmed to be completed in FY 1989.

OPERATION AND MAINTENANCE, GENERAL

The budget provides $1.28 billion for the Operation and Maintenance (O&M), General, program, including $164 million from the Harbor Maintenance Trust Fund and $20 million from Special Recreation Use Fees Fund. The proposed operation and maintenance program is some six percent below the FY 1989 appropriation. As already discussed by Mr. Page, we are pursuing an alternative program to lessen the impact of this reduction. Our divisions are now reevaluating their O&M programs based on new criteria and will report proposed changes to me. During this reevaluation process, the divisions will consult with local interests and Congressional delegations in order to develop a more acceptable program. After review of the Corp's proposals, the Secretary will furnish this Subcommittee a final recommendation for allocations of the budgeted O&M funds.

To further help mitigate the impact, we are requesting $1.0 million for a Recreational Partnerships study initiative. The study will attempt to identify options that could be effective in encouraging recreational development at our projects with private capital. We have also submitted legislation that would permit us to impose additional user fees in order to obtain added revenue for our recreational program. Receipts from these fees would not be available until FY 1991 at the earliest. However, enactment is extremely important to the future operation of the 2400 existing recreation areas operated by the Corps.

FLOOD CONTROL, MISSISSIPPI RIVER AND TRIBUTARIES

The budget provides $337 million for the studies, construction, and maintenance programs for the M R & T project. This includes the funding of one new preconstruction engineering and design start and one new construction start. The recommended construction start, Nonconnah Creek, Tennessee previously was budgeted in FY 1989 but was not funded by the Congress. The amount included for the maintenance of the project features is comparable to that funded by the FY 1989 appropriations and is based on normal operating experiences.

OTHER PROGRAMS AND ACCOUNTS

The budgets for the Regulatory Program and the General Expenses accounts warrant special mention. First, it should be noted that the President's budget includes a FY 1989 supplemental request which provides for within total transfers to these two accounts for increased pay costs. The FY 1990 General Expenses account, moreover, includes a one-time request of $1.8 million for its share of some software conversion costs associated with our automation plan that the Congress has approved. At the same time the FY 1990 Regulatory Program has been increased by $9 million, $4 million of which is to administer the bridge permit program, a function that the Administration is proposing be reassigned from the Coast Guard back to the Corps.

New funds amounting to $23 million are requested for the Revolving Fund's Plant Replacement and Improvement Program. The funds are required for the pilot test phase of our automation plan's hardware acquisition. We expect to award the contract for the test phase in the fourth quarter of FY 1989. We also are scheduled to complete the design for a replacement dustpan dredge in FY 1989 and begin construction in FY 1990, using the Revolving Fund's own resources. Similarly, Revolving Fund assets will be used for improvements to our Missouri River Division Laboratory to accommodate quality assurance testing needed in support of our Civil and Military hazardous waste treatment programs. The Revolving Fund will be reimbursed by the benefitting agencies.

Also involved with the Revolving Fund is the proposed disposal of the headquarter's airplane. We are pursuing transferral of the plane out of the Revolving Fund to the Military District of Washington which currently owns and operates other Army aircraft. Under the proposed arrangement, the aircraft will be available to the Corps and other Department of Army staff elements. We will keep the Committee informed of developments in this matter and, if successful, suggest language which would permit us to transfer the aircraft.

MANPOWER

Our manpower ceiling of 28,115 Full Time Equivalents (FTEs) is a decrease from the 28,181 FTEs authorized for FY 1989. The change reflects the net decrease that is expected to accrue in savings from the A-76 Program, offset by an expected increase in the EPA Superfund Program workload. Increased requirements to support the recommended new planning, preconstruction engineering and design, and construction starts, will be resourced from within our ceiling. Also included in the ceiling is an additional 55 FTEs for us to manage the Bridge Administration program, assuming the transfer is made.

We are continuing to pursue A-76 Program savings vigorously. Savings for FY 1988, 1989, and FY 1990 were projected to be approximately 135, 180, and 257 FTEs, respectively. Actual FY 1988 savings were about 100 FTEs. As these savings are realized, the size of the headquarters is being reduced and I will be transferring some operating activities to subordinate commands. I also am restructuring the headquarters. A change is necessary to enhance the responsibility and accountability in the management of both the Civil Works and the Military Programs. Therefore, in addition to reducing the headquarters staff, I am reorienting the remaining staffs into separate Civil and Military Directorates and providing each Director with the necessary resources for the control and execution of his programs. Over the last few years, we have instituted some significant reforms that not only will reduce the planning and the engineering and design timeframes but also achieve better control of project schedules and costs. Most of the procedures for these reforms are in place. And as Mr. Page has stated, emphasis on the application of the Life Cycle Project Management concept for controlling all project phases - from planning to completed construction - will continue into this year. As a follow-on to these initiatives I, with the assistance of my senior staff, have put together a Management Emphasis Program called " Focus 89 ". It is the first step in implementing the goals and priorities which I have published and to which I am committed during my tour of duty. The underlying objective of " Focus 89 ", and really my total course of action, is two-fold: one is to identify and resolve those key management issues that hinder our ability to be more efficient and business-like in dealing with our customers and partners; and the other equally important one is to focus on internal professional and leadership development and the work environment in order to maximize personal and team growth. All of these actions, together with improved information systems and automation, should reinforce our commitment for strengthing the Civil Works Program and to establish a strong foundation for adjusting to any future changes.

As you know, the Corps provides design and construction management assistance to other Federal agencies when it is most efficient for the Government or where we believe that the work will reinforce the skill we need to maintain and perform our mission work. By far the largest support we give to other agencies is that we give to EPA. The Office of Management and Budget has provided the additional personnel allocations to allow the Corps to support this important program.

CONCLUSION

The budgeted program for FY 1990 is a good one. It reflects the Administration's commitment to the development of those water resources which strongly contribute to the Nation's basic economic infrastructure. The 31 reconnaissance phase new starts represent the highest number budgeted since the two-step study process was initiated. The same applies to the 41 PED projects. The selected studies and projects are ones we feel have the best chance of resulting in a construction program that will be economically justified and warrant Federal participation. I know this mirrors the desires of the Subcommittee for funding a planning and engineering and design program sufficient to sustain, over time, a realistic investment level that the eleven recommended new construction starts represent.

This completes my statement, Mr. Chairman.

TABLE A
DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS - CIVIL WORKS
SUMMARY OF PROGRAM AMOUNTS FOR FISCAL YEARS 1988, 1989, AND 1990
(Dollars in Thousands)

APPROPRIATION TITLE	FY 1988 (Approp.)	FY 1989 (Approp.) a/	FY 1990 Budget Request	
GENERAL INVESTIGATIONS	138,767	142,405	126,108	b/
CONSTRUCTION, GENERAL				
General Funds	1,129,542	1,123,735	1,082,790	c/
Inland Waterways Trust Funds	70,633	61,000	119,000	
TOTAL APPROPRIATION	1,200,175	1,184,735	1,201,790	
OPERATION AND MAINTENANCE, GENERAL				
General Funds	1,240,000	1,199,714	1,098,622	
Special Recreation Use Fees	12,000	15,000	20,000	
Harbor Maintenance Trust Funds	148,000	156,000	164,000	
TOTAL APPROPRIATION	1,400,000	1,370,714	1,282,622	
REGULATORY PROGRAM	55,262	60,427	69,427	d/
F.C., MISSISSIPPI RIVER & TRIB'S	317,704	337,980	337,000	
GENERAL EXPENSES	115,200	120,000	128,800	
F.C. & COASTAL EMERGENCIES	20,000	20,000	0	
REVOLVING FUND	0	0	23,000	
PERMANENT APPROPRIATIONS	11,802	12,000	12,000	
TOTAL, FEDERAL BUDGET AUTHORITY	3,258,910	3,248,261	3,180,747	
RIVERS AND HARBORS CONTRIBUTED FUNDS	146,042	185,000	223,000	b/
TOTAL PROGRAM	3,404,952	3,433,261	3,403,747	

a/ Does not reflect: (1) proposed FY 1989 supplemental for within total adjustments to: Construction, General (-$2.6 million); Operation & Maintenance (-$1.1 million); Regulatory Program (+$1.1 million); and General Expenses (+$2.6 million); and (2) the President's March 24, 1989 proposal to reduce the Corps' FY 1989 program by 1.09% to help fund the proposed supplemental for other programs. The outlay reductions would be applied proportionally to the appropriation accounts.

b/ Under proposed legislation, matching fund contributions would be required for two programs: Planning Assistance To States and Flood Plain Management Services.

c/ Includes $2.0 million which, under proposed legislation, would require Army to assume responsibilty for the bridge program now administered by the U.S. Coast Guard.

d/ Includes $4.0 million which, under proposed legislation, would require Army to assume responsibilty for the bridge program now administered by the U.S. Coast Guard.

BUDGETARY LIMITATION VERSUS REAL NEED

Senator **Johnston**. Gentlemen, Reaganomics has been both praised and criticized a great deal. But there is one thing that is undeniable and that is, in the 8 years of the Reagan presidency, the budget for Energy and Water Development has been cannibalized every year—it is less, in real terms, about 15 percent less. That is unlike entitlements, unlike defense programs, unlike many other parts of the budget which have continued to expand.

Now, the needs of the country have not gone down by that much. To the contrary, we simply have, as last year, for example, had a no new-start policy. Now, that is very easy to do, just say, "No new starts, and everything is OK; the public wants to save money."

But every year we hear witnesses testify about the need for new starts. There is a project in California—the Santa Ana River Flood Control Project—it is a huge project, as you know. But it is economically feasible with a good benefit-cost ratio. The project provides protection to life and property. We heard testimony about navigation projects with inadequate depths, where there has been the loss of life because of lack of dredging. So we have numerous places in need and where projects ought to be built.

Now, I just do not think we can responsibly continue with a no new-start policy. The administration's budget includes 11 new starts. We are going to have a very, very tough time in figuring out what to wean out, what to wean in.

In addition, we have to deal with the section 302(b) allocation process from the Appropriations Committee. That allocation, to a great extent, will dictate what we will be able to do. I hope it will be sufficient to cover our fundamental needs so that we can, at least, get started on a few of these very high-priority projects.

But as it is now, we are looking at the possibility of having to cull out the new starts, as well as closing small ports and recreation areas nationwide. Indeed, your policy right now under this budget request would require the closing of small ports and recreation areas; does it not?

Mr. **Page**. Yes, sir.

Senator **Johnston**. Well, we are going to need greater detail from you on the criteria by which you are closing these small ports. We have received many, many letters from members of Congress requesting that we not close these recreation areas and small ports. They are important to various States and communities. They are vital to us.

But if we do not get sufficient section 302(b) allocation, we will have to do something—we will not be able to accommodate everything. I will have some questions in writing for you about new starts to help guide us with more information about how we may set criteria on those.

Now, those are just new starts in water, which is what you do. We will probably have 30 requested new starts in water over and above the 11 you have budgeted. I do not know how many we are going to have on the other side of the ledger, the DOE science programs.

By the way, we want to change the name of this committee. It is now Energy and Water, but, really, the science part of our jurisdiction is really a lot more important than the energy part. We have got some vital energy functions; they happen to be under the Department of Energy, but they are more properly designated as science. We have a really very, very important science jurisdiction here.

"NO NET LOSS" OF WETLANDS POLICY

Now, this question is directed to both of you. You have stated that you are going to go along with the President, or you are following the President's policy in implementation of no net loss of wetlands. Is that possible from an engineering standpoint?

Mr. PAGE. Senator, first of all, there is confusion among the agencies, ourselves, EPA, and also those out in the various districts and divisions about just what that means. We interpret it to mean, and I have discussed this with EPA, that, overall, nationally, no net loss. There is no possible way that we can, from an engineering or any reasonable development standpoint, impose no net loss on each project.

Senator JOHNSTON. All right, now, I understand that. Now, do you know how much the State of Louisiana is losing each year in wetlands?

Mr. PAGE. I could not give you the acreage, but I will tell you that I have been there a number of times——

Senator JOHNSTON. Would you be surprised to learn it is about 60 square miles a year?

Mr. PAGE. And that is coming right off the coast.

Senator JOHNSTON. When you say "no net loss," do you mean you are going to add 60 square miles of wetlands somewhere else or are you going to save that 60 square miles?

Mr. PAGE. Well, first of all, I do not know what our policy would be in saving eroding coastline, because we do not have responsibility in that area. But we are looking at the possibilities now of setting up a mitigation-type bank, whether it would be a revolving fund for restoration of wetlands or mitigation of wetland loss by buying land itself.

Senator JOHNSTON. First of all, without respect to what you are doing in terms of banks, is it possible in Louisiana to have a no net loss of wetlands policy? If you had $100 billion, could you do it?

Mr. PAGE. I do not think so. No net loss?

Senator JOHNSTON. General Hatch.

General HATCH. Sir, I assume you are including the loss of the tidal marshes, which is a major portion of the total loss in the State of Louisiana, which, as you know, we are studying. I believe there are ways to attenuate that loss, but with coastal and shoreline subsidance and some of the other work of nature, I doubt very seriously, even though we pursue our current program of fresh water diversion and do a variety of other things to limit man's activities in those coastal marshes, I do not believe it will ever be economically feasible to completely stop it. But I believe we could attenuate that loss.

Senator JOHNSTON. How much money would you need to stop the loss, within the nearest $10 billion?

General **Hatch**. Sir, this may sound facetious, $10 billion, plus or minus $10 billion. Sir, I really have no idea. We have not studied it and I would be remiss if I tried to throw a figure out in this hearing to give you.

GOAL OF "NO NET LOSS" POLICY

Senator **Johnston**. People in my State see this policy, no net loss, and you say here the task force will consider the implementation of a no net loss of wetlands as a national goal. Now, is that just a jumble of words that do not mean a thing? I submit it is. But I think we need to be straight with the people and tell them why, what is the goal and why it is there.

General **Hatch**. Sir, I believe that goal, as simply stated, is a good goal, it is a true goal and a worthy goal. What the task force has to do is define——

Senator **Johnston**. Well just a minute, General Hatch. Can you save 60 square miles in Louisiana doing anything?

General **Hatch**. Sir, I am not certain and I do not know if we will know until the task force has drawn its conclusions, the extent to which they considered coastal marshes of Louisiana as part of that wetlands loss. They may well have focused on inland.

Senator **Johnston**. They may not have considered that?

MEANING OF "NO NET LOSS" POLICY

General **Hatch**. I am not certain, sir. I am also not certain what "no loss" means. Is it value? Is it acreage? There are a lot of questions that need to be answered.

Senator **Johnston**. Oh, I see. Kind of like that budget balancing we went through. It is balanced, but it is not balanced. So "no net loss" may mean in dollars and it may mean in acreage or it——

General **Hatch**. Fish and wildlife value?

Senator **Johnston** [continuing]. It may not count Louisiana. It may count something else.

General **Hatch**. It certainly would include interior Louisiana. I am not certain, because I was not the author of those words, the extent to which they really were addressing the coastal losses.

FORMATION OF TASK FORCE TO ADDRESS POLICY

Mr. **Page**. Senator, we understand and we have seen the loss. We have addressed this problem to a number of groups during the year, down in various meetings in New Orleans. We have asked and are going to put together a task force which will be centered around the leadership of General Sands out of Vicksburg. We hope to bring together all of the different environmental agencies, also different governmental agencies that would be looking at this wetland loss.

Senator **Johnston**. Well, when do you hope to do this?

Mr. **Page**. We are starting now.

Senator **Johnston**. What do you mean, starting?

Mr. **Page**. We are starting to put together the group now and to get an agenda, to get each one of these committees or agencies agreeing to come and work with us on this problem, to study it and see what we can do jointly.

URGENCY OF NEED FOR ACTION BEYOND STUDY

Senator JOHNSTON. Secretary Page, let me tell you how unacceptable that is to people in Louisiana to say we are starting to study. I go down and I tell people, I met with the Corps, I put together legislation, and they say, look, we have studied enough; we want action.

Now, obviously, we could not just give them $10 billion and say, "Go do something." We have got to figure out what to do. But the administration is doing nothing but giving us meaningless, absolutely meaningless, words, going around saying no net loss, and they are commencing to think about the possibility of putting together a task force that may study the issue. And that is about it.

I mean, we have just got to do something specific and analyze it in a hard way and tell us whether or not, when you mean no net loss, whether that includes Louisiana. It cannot, there is no way to save 60 square miles; we know that. So, the only way you can do it is to either say it does not include Louisiana, or we mean something else. What do you mean and how are you going to do it?

We have got to figure that out. This is a very big problem. People in my State not only are worried about the fact that the Gulf of Mexico is going to be up in the town of Houme in not too long, and that is many miles from the coast right now. But they are worried about over a billion pounds of commercial seafood out there, the hatchery for which is in those wetlands. I mean, what are we doing?

LOUISIANA COASTLINE STUDIES

General HATCH. Sir, if I may? We have four ongoing studies that are addressing specifically the problems on the coastline of Louisiana. Two of them are particularly pertinent to, I believe, your concerns.

One is entitled the Mississippi River Delta Study; that is in the reconnaissance phase and is almost complete. That is discussing primarily the feasibility of implementing some measures that would increase the deltaic land building, which had occurred over the centuries, that, as you know, for good, sound reasons at the time—flood control and navigation—we interrupted. Now we we're going back to look at that to see how we might provide some of those sediments coming down the Mississippi River into those areas that are being lost.

The second study is entitled The Louisiana Comprehensive Coastal Wetlands Study. This was largely General Sands' initiative, realizing, and we all shared a frustration, that both State, local, and Federal agencies were looking at the problem but were not getting together to do anything. So we came up with a study that we felt that we could pursue under our authorities.

The reconnaissance should be finished this summer, and we plan then to move into feasibility, which will be cost-shared with the State of Louisiana, assuming we have a cost-sharing partner and we are able to validate the continued viability of that study effort through our processes here.

So we are studying it, sir. We are concerned about it. I must admit it was only 2 or 3 years ago when we became that acutely aware of it. We are as alarmed as you are over that great loss.

NEED FOR ADMINISTRATION'S "NO NET LOSS" PLAN

Senator **Johnston**. Well, gentlemen, I know it is not just your work that is not being done here. The Corps is usually not the problem. You have got to have a mandate from on high. But the heat has been turned up on this issue; it has been turned up on me, and rightfully so. Because our people want some action.

Now, there is no money in this budget for coastal Louisiana. Now, we need something more than words. I mean, I have got some legislation in as part of Arctic National Wildlife Refuge to dedicate 15 percent of that to coastal rehabilitation and savings. Of course, the Alaskan oilspill did not speed that along any. But the administration does not like that.

The administration has got to come up with something, some plan, so we can identify and begin to fund all these things. Of course, it would be fine to ask for 50-50 cost sharing. But the State of Louisiana is trying to find $700 million right now. Louisiana is broke—they are having to cut back an already terrible budget. It appears that they are going to have to cut by 25 percent the funding for State universities. So that is no answer.

This is really a national problem, and it has got to be faced up to. If the Corps needs some legislative help, and I suspect you do, please tell us about that. I met with Tommy Sands recently and he is concerned about this problem. Everybody says, well, yes, we want to do something but we do not really have the mandate. We do not know quite what to do.

Mr. **Doyle**. Mr. Chairman, the purpose of the interagency task force that will be convened shortly is to do exactly, as I understand it, what you are calling for, to get all of the agencies together that have a role to play, have responsibilities with respect to wetlands and wetlands preservation, and develop a coordinated effort that then can be communicated to the Congress and to non-Federal interests throughout the country in order to try and have this Nation do a better job than we've done in the past, protecting the wetlands that recently have come to be appreciated as so important.

Senator **Johnston**. Do you know when this study is going to be commissioned?

Mr. **Doyle**. Very shortly, sir.

Mr. **Page**. Senator, I could not agree with you more. You know, we study and we study and we are doing studies now, but, like you say, we need legislation. I think there is nothing like getting enthusiasm in a study that has a real end-product with some money to fund it.

Senator **Johnston**. What money do we need?

Mr. **Page**. I think the challenge is to define this and just what kind of legislation we need.

NEED FOR WETLANDS CZAR

Senator **JOHNSTON**. I do not want to take all of the time of the committee, but somebody needs to be in charge. Yet, nobody is really in charge of wetlands policy. You talk to one agency, and, well, they are studying it or they may do something next year. Then you talk to another and they plan to put a task force together—then nothing gets done.

Are you the appropriate one to do that, Secretary Page, to be the wetlands czar?

Mr. **PAGE**. If we are not, we will be. Because if there is a mantle to be picked up, we will be happy to do it. I think we should. You have given us the charge to do it, and I think we would like to do that.

Senator **JOHNSTON**. Will you take the charge, you and General Hatch, will you take the charge? Are you the ones to do it or should we get someone else? And if you do not have the authority, will you ask us for it? We have got an appropriation bill coming along and we can legislate to give you whatever authority you need.

Mr. **PAGE**. I would like to do it.

General **HATCH**. Sir, we have no specific authorities at this time, other than as, if you will, adjunct to our other primary purposes, to tackle this.

Senator **JOHNSTON**. Will you tell us what you need and we will give it to you?

General **HATCH**. If you wish to know what we would need to have that authority, we will provide it to you, sir.

Senator **JOHNSTON**. Do you think you are the appropriate one to do it?

General **HATCH**. If there is to be a Federal agency involved in it, we would be the appropriate one, sir.

Mr. **PAGE**. Well, we both agree on that. There are other people that will not agree.

Senator **JOHNSTON**. Senator Burdick wants to say a word.

Senator **BURDICK**. Would you mind going up to North Dakota and look at that, too?

General **HATCH**. The wetlands of North Dakota will be included, and the task force is concerned with the wetlands throughout the United States.

Senator **JOHNSTON**. Well, I have taken a lot of time on wetlands, but I think we have agreement now that we are going to receive requests from you as to what legislation you need and you will proceed to be our lead agency, our czar, on wetlands. We will give you what you ask for, I suspect, because, between Senator Burdick and me, we want to do something about wetlands. Everybody else up here does, too. My apologies to you, Senator Hatfield, for taking so much time.

[The material follows:]

WETLAND LEGISLATION

Unfortunately, we are not in a position to give you a specific answer to your question at this time; however, as previously mentioned the executive branch agencies will be examining legislative and administrative needs to address the wetlands problem. Any legislation deemed necessary will be developed and coordinated among the executive branch agencies and transmitted to Congress.

General HATCH. The Environmental Protection Agency, as you well know, has certain responsibilities concerning water quality, and, hence, have very definite interest and responsibilities for wetland. I would not, even in response to your question, suggest reversing of current assignment of responsibilities. I would suggest that, perhaps, there is a void and we might address that.

Senator JOHNSTON. We need coordination between Federal agencies.

Mr. PAGE. We will address that.

Senator JOHNSTON. Absolutely. Who should be the agency to identify projects to be studied and to direct the work, to parcel out the work? Somebody has to be in charge. And I think right now there is no one, really, by law, charged with being the lead agency.

General HATCH. Certainly not in the creation of wetlands or the extent of mitigation that perhaps could be arising from your line of questioning.

Senator JOHNSTON. There is no one in charge of getting a national wetlands plan that evaluates North Dakota and Louisiana, who puts values on those benefits and costs, and decides what we are going to spend, how we are going to spend it, what we can afford to do.

ADDITIONAL PREPARED QUESTIONS SUBMITTED FOR THE RECORD

I do have several other questions related to this issue that I will make part of the record for your response.

[The questions and answers follow:]

LOUISIANA WETLANDS

Question. Why are Louisiana wetlands so valuable to the Nation?

Answer. Louisiana's coastal wetlands are part of a highly productive ecosystem. The wetlands supports 30 percent of the Nation's commercial fish and shellfish harvest. In addition to the ecological values, the Federal government has made a significant investment in navigation and flood control systems within Louisiana's coastal wetlands. These systems are threatened by continued wetland loss. Extensive mineral reserves exit beneath the wetlands that supply a significant share of the Nation's oil and natural gas.

Question. Why are Louisiana coastal marshes and wetlands disappearing at such a rapid rate?

Answer. Natural coastal and deltaic processes coupled with human activities have accounted for the rapid loss of Louisiana's coastal wetlands. The long-term forces of subsidence, sea level rise, saltwater intrusion and erosion have been responsible for the natural loss of wetlands. Together, the sinking land surface and rising water surface account for much of the wetland loss. These factors intensify saltwater intrusion and erosion and accelerate the conversion of wetlands to open water.

The activities of man in Louisiana's coastal wetlands have also contributed significantly to wetland loss. Indispensable flood protection in the flood prone lower Mississippi Valley and nationally important economic development in Louisiana's wetland have caused wetland loss. Flood control levees along the Mississippi and Atchafalaya Rivers have confined these rivers and changed the natural annual hydrologic regime in which the rivers overflowed their banks each spring, flooding adjacent marshes with nutrients would build and sustain the diversity of the wetlands. The deepening of these rivers for navigation has resulted in the deposition of millions of tons of sediment in the deep waters of the Gulf of Mexico rather than in shallow bays where wetlands could develop. Louisiana's wetlands are laced with 8,200 miles of navigation, drainage, and petroleum access canals. Wetlands are lost during excavation of these canals and are buried as the dredged material is piled next to erosion. Saltwater quickly flows into the wetlands through these canals and causes even greater erosion.

Question. What is the Corps of Engineers doing in Louisiana to address the problem?

Answer. The Corps has and continues to be, actively involved in constructing, designing, and planning wetland preservation, enhancement, and creation projects within coastal Louisiana. As a result of the disposal of shoal material dredged during maintenance of navigation channels within the coastal area, approximately 3,000 acres of marsh will be created over the next 50 years as part of the construction and maintenance of the recently completed 45-foot increment of the Mississippi River Ship Channel, Gulf to Baton Rouge, project. As opportunities are available, material from maintenance of other navigation channels will be used to create additional marsh.

Construction has begun on the Caernarvon Freshwater Diversion Structure which will preserve and enhance 16,000 acres of marsh and produce an average annual increase in commercial fish and wildlife production of $6,700,000 within the Breton Sound Basin over the 50-year project life. Advance engineering and design is underway on the Davis Pond Freshwater Diversion Structure. This project will preserve 83,000 acres of marsh and produce an average annual increase in commercial fish and wildlife production of $10,900,000 within the Barataria Basin over a 50-year project life. Preconstruction engineering and design is continuing on the Bonnet Carre Freshwater Diversion Structure. This diversion project will preserve 10,500 acres of marsh and produce an annual average increase in commercial fisheries production of $7,900,000 within the Mississippi Sound over the 50-year project life. Shoreline protection features are being considered along the Mississippi River-Gulf Outlet Project that would reduce the projected dramatic increases in shoaling rates and protect 1,700 acres of marsh from erosion over the 50-year project life.

Three studies are underway under the Louisiana Coastal Area authority. The Louisiana Comprehensive Coastal Wetlands Study is in the reconnaissance phase and its purpose is to define how various Federal, state, local and private wetland projects and plans will be integrated into a comprehensive plan to protect, restore, and enhance Louisiana's coastal wetlands. For this study the evaluation and screening of the projects and plans will not rely on the traditional benefit/cost analysis; however, it will also not directly result in any Federal project in the traditional sense but result in a comprehensive plan. The Land Losses and Marsh Creation Study, a feasibility study, is considering the advisability of creating marsh with dredged material or by the large- and small-scale diversion of river sediments. As a part of this study, an economic analysis of the value of marsh has been conducted and is presently undergoing review. The Shore and Barrier Island Erosion Study did not identify economically feasible improvements or modifications of existing improvements that would provide shore and barrier island erosion control along Louisiana's coast. However, the alternative plans of improvement that were identified will be considered further under the Louisiana Comprehensive Coastal Wetlands Study.

The Atchafalaya Basin Water and Land Resources Study is in the feasibility phase. Its purpose is to investigate alternatives to optimize development of marsh within the actively growing Atchafalaya Delta, while at the same time maintaining the navigation and flood control functions of the Atchafalaya River.

CAERNARVON FRESHWATER DIVERSION

Question. Does the Corps have the capability to advance work on the Caernarvon Freshwater Diversion structure, and if so, how much money could be used?

Answer. We do not have the capability to advance work on this project. The $4,050,000 requested in the President's Budget is sufficient to carry out the construction contracts scheduled for fiscal year 1990. This project is progressing very well and we will finish it on time in November 1990.

DAVIS POND FRESH WATER DIVERSION

Question. How much funding is included in the budget for the Davis Pond Freshwater Diversion structure? Since this structure provides more than half of the entire benefits for the Mississippi Delta Region project, why have no funds been requested? Does the Corps have the capability to accelerate the planning and design, and construction on this feature? If not, why not?

Answer. I am happy to inform you that funds in the amount of $600,000 are included in the President's Budget for the continuation of the engineering and design of this project in fiscal year 1990. However, we do not have the capability to accelerate our work. The $600,000 is the maximum amount that we can efficiently utilize based on sound engineering practices and the local sponsors capabilities. With that money, we will be able to go forth in an orderly fashion on our engineering and design efforts and our proceedings with Louisiana in executing a draft Local Cooperation Agreement.

BONNET CARRE FRESH WATER DIVERSION

Question. Now the Bonnet Carre Freshwater Diversion project was just authorized in the 1988 Water Resources Development Act. What is the status of that project, and can funds be used in 1990 to begin the engineering and design effort.

Answer. The preconstruction engineering and design is nearing completion on this project. However, the General Design Memorandum document is under review by Secretary Pages' office. There is the outstanding question of the appropriate cost sharing for the project. Secretary Page is working with the Office of Management and Budget to arrive at a position on this question so as to present it to the State and Congress. Once that issue is settled, the project will be included in the budget process. Until that time, we can not express a capability for funds in fiscal year 1990.

INVESTMENTS AND BENEFITS MISSISSIPPI VALLEY IN LOUISIANA

Question. What benefits have been realized in dollars terms in the Mississippi River Valley and Louisiana specifically as a result of the flood control and navigation investment of the Federal Government?

Answer. We estimate that $214 billion in benefits have been realized to date. Of this amount $134 billion is attributed to the state of Louisiana.

Question. How much have Federal, state and local governments invested to create this benefit?

Answer. Our best estimate of investments thus far is that the Federal Government has invested $11.3 billion, the state of Louisiana $0.5 billion, and the local governments $1.0 billion.

Question. What is the implication of delineation [the new wetlands delineation manual] on wetlands in the Mississippi Valley?

Answer. It is somewhat premature to predict exactly how the new delineation manual will affect wetlands delineations in this area. Many Corps districts have been using the three parameters of vegetation, soils, and hydrology to establish jurisdictional boundaries and will experience little change in jurisdiction under the new manual, which uses a similar approach. Until adoption of the new manual, however, the Corps had no single specific methodology. Districts within the Mississippi Valley had been relying exclusively on a list of vegetation occurring in wetlands which has resulted in relatively conservative jurisdictional determinations. As a result, EPA chose to designate a "special case," which resulted in EPA using its methodology to make wetland jurisdictional calls in much of the area. Jurisdictional determinations made by EPA within a special case area represents the final Federal Government position. The EPA delineation approach is similar to that required by the new manual. Thus, current Corps jurisdictional determinations should be similar to those made by EPA while the area was considered a special case.

Senator JOHNSTON. Senator Hatfield.

NEW CONSTRUCTION STARTS CRITERIA

Senator HATFIELD. Thank you, Mr. Chairman. Mr. Secretary and General Hatch, first I would like to say I have so much to be appreciative to the Corps for in my State of Oregon and Pacific Northwest. Over many years, the Corps' performance and contributions have been excellent, the most recent being the involvement in the draft cost-sharing agreement for State-sponsored projects, for which I commend you again for helping to negotiate successfully.

I would like to just pick up on the chairman's questions relating to new starts. I would like to remind my colleagues on the committee that new starts, even though we have about $87 million in this Corps budget request, ought not to be at the expense of existing commitments, for one. I think we ought to use that as a criterion.

The offset for that $87 million includes the closing of four ports along the Oregon coast, as far as operation and maintenance is concerned, and it includes the closing of 31 recreation sites in the State of California alone.

Now, the second criterion—and I would like to have your response to this observation—is relating to having a reasonable expectation to complete the project.

SANTA ANA RIVER FLOOD CONTROL PROJECT, CALIFORNIA

Now, let me illustrate my point. They are suggesting $20 million for a new construction start for the Santa Ana project in California, a project that has an estimated cost of $1.4 billion, of which $1 billion is Federal. We do not even know where the next dollar is coming from in many instances, in terms of construction projects.

I just want to urge the Corps and the Secretary to take seriously this matter of even the new starts that you are recommending. Where are we going to get $1 billion? Do you have, really, a high degree of expectation that, if we commence a Santa Ana project at this time with a $20 million down payment, this Congress or the future Congresses will be able to come up with $1 billion, minus $20 million?

Mr. **Page**. To answer your question, yes, sir. We made that assumption when we analyzed its justification in light of need for adequate flood protection in this part of the State of California. If we felt there was a real strong possibility that this project would not get further budgeting after $20 million, we might put it to a stop. But I do not think we have the authority to do that.

Senator **Hatfield**. Mr. Secretary, I might say that this project was one of the few new starts offered by the Reagan administration. At that time, it was to be started with a $15 million down payment. Now, it just seems to me that it has an interesting heritage, first of all, but also it has a more questionable future, in terms of reality.

All I am suggesting, is that when we wrestle in this committee and say no new starts, because we do not know where the next dollar is coming from for construction of a new start, how in the world can you sit here and seriously tell us today that you really believe there is some possibility that a $20 million down payment on a $1.4 billion project is reasonable or that you expect to complete the project once you undertake it. It puzzles me.

General **Hatch**. Senator, may I take a crack at that? In our budget development process, we require ourselves, as does the Office of Management and Budget, to demonstrate that construction of a project will be affordable through its construction period within reasonable expectations of a total budget still providing for doing our O&M and other things.

So we are not just buying in with a nose of the camel under the tent type of situation. The Santa Ana project is an example of that. In fact, the House last year raised the same question and we determined this year we would come in and be able to demonstrate that, and we could for this committee as well.

REEVALUATION OF OPERATION AND MAINTENANCE BUDGET

I might add a comment concerning the recreation areas and the harbors that you mentioned. The numbers you gave, I believe, are correct based on our first look at that. That entire operation, if you will, is under serious review under broader criteria. It would result in a different set of numbers, and we will be in contact with you as soon as we have had a chance to reevaluate that.

Senator HATFIELD. Well, whatever numbers you come up with, General, let me say as far as one member of this committee is concerned, as much as I may be supportive of a new-start concept and of a specific project, if it is a tradeoff or if it is going to be at the expense of O&M projects, I am not going to support that. I do not think that is a worthy tradeoff. Now, that is just my own personal view.

SUPREME COURT DECISION, ELK CREEK, OR

Mr. Chairman and Senators, I would like to urge all of you to take a hard look at the Supreme Court ruling on Monday of this week. Mr. Chairman, I was saying I would like to urge all of my colleagues to take a hard look at a unanimous decision of the Supreme Court on Monday, this week, reversing the 9th Circuit Court of Appeal decision on the Elk Creek Dam project from the State of Oregon.

Why I suggest this is that this is a landmark decision, from our analysis, that relates to a project that was authorized in 1962 and was 60-percent complete in construction in 1987 when the circuit court, the Ninth Circuit Court, not only commanded that project to be halted on the basis of an injunction offered by a very small radical environmental organization, but also cost the Corps $40 million to shut it down. The Supreme Court has ruled that the Ninth Circuit Court decision was erroneous.

To a layman interpreting that decision, it said, in effect, that new technical data and materials have to be interpreted by the agency involved because they are the competent people, they are the technicians, they are the experts, to make an analysis of that material, not the court. The Ninth Circuit Court had assumed as it has many times in the past, the role of the professional technician in matters governing public land policies.

Now, this was a unanimous decision written by Justice Stevens, one of the old liberal members of the Court, and not one of the new Reagan appointees. As this environmental group responded, President Reagan has changed the complexion of the court. Well, it was a unanimous decision. Now, I want to raise that because it could have very great implications beyond just the Elk Creek Dam in Oregon.

NEW COST ESTIMATE FOR ELK CREEK PROJECT

Now, my question, really, to you, Mr. Secretary and General, is what do you now estimate the cost to complete this project will be? Assuming that you go back, as the court has remanded this to the district court in Oregon, and complete the data gathering and analysis, and assuming that the data information analysis comes out still in support of the project, and we have to rebid this now, start back from scratch to complete it. What do you estimate, or do you have for the record, the cost of the project?

General **Hatch**. Sir, if I may, it will take us about 1 year to do the required supplemental environmental impact statement. Meanwhile, we actually have to go through a brief redesign, and through that process we will develop a cost estimate. If it is permissible for the record, we will provide, within very short order, at least a rough estimate of what the cost might be.

Senator **Hatfield**. All right, if you could do that for the record, I would appreciate it. And, also, would you provide for the record and for the members of this committee the legal analysis of that landmark decision by the court, as you have analyzed it, so that we can have that as some additional guideline?

General **Hatch**. Yes, sir.

[The information follows:]

ELK CREEK LAKE COST ESTIMATE

Our preliminary total project cost estimate is about $162,000,000. A firmer cost estimate will be available in connection with fiscal year 1991 budget submittal to Congress.

ELK CREEK LAKE LEGAL ANALYSIS

United States Supreme Court's holding in *Marsh* v. *Oregon Natural Resources Council* (Elk Creek).

[The information follows:]

DEPARTMENT OF THE ARMY,
U.S. ARMY CORPS OF ENGINEERS,
Washington, DC, May 16, 1989.

Memorandum for Director of Civil Works.

Subject: United States Supreme Court's holding in *Marsh* v. *Oregon Natural Resources Council* (Elk Creek).

1. This memorandum provides a brief summary of the holdings in the U.S. Supreme Court's recent decision in *Marsh* v. *Oregon Natural Resources Council (Elk Creek)*, 57 LW 4504 (1989), regarding the adequacy of the Corps' EIS and Supplemental EIS (SEIS) prepared for the Elk Creek Dam project. *Elk Creek* was decided along with a companion case, *Robertson* v. *Methow Valley Citizens Council (Methow Valley)*, 57 LW 4497 (1989), involving an EIS prepared by the Forest Service. (Copies of both cases are attached for reference.) In *Elk Creek* the Ninth Circuit Court of Appeals had held that the Corps SEIS was defective and failed to meet the requirement of the National Environmental Policy Act (NEPA) of 1969, 42 U.S.C. 4332, because (1) it did not adopt a complete mitigation plan, (2) it did not include a "worst case analysis," and (3) the Corps did not prepare another SEIS based on new information. However, the U.S. Supreme Court unanimously reversed the Ninth Circuit's decision on all three issues. Addressing the first two issues in *Methow Valley* and incorporating that discussion into its decision in *Elk Creek*, the Supreme Court held that:

a. NEPA does not require that a complete mitigation plan be adopted in the EIS;

b. NEPA does not require a "worst case analysis" in the EIS when information is unavailable on the potential impacts of the proposed action; and

c. In determining whether a SEIS is required an agency must apply the "rule of reason." However, Court review of an agency's decision is controlled by the "arbitrary and capricious" standard of the Administrative Procedures Act (APA), 5 U.S.C. 706(2)(a), and the Court will defer to the agency decision unless such decision is "arbitrary and capricious" or there is a "clear error of judgment."

2. In discussing the need for a mitigation plan, the Supreme Court held that NEPA requires that an agency take a "hard look" at environmental consequences and provide a thorough discussion of possible mitigation measures, but that there is no substantive requirement that a complete mitigation plan actually be formulated and adopted in the EIS. In *Methow Valley*, the Court stated that:

Although these procedures are almost certain to affect the agency's substantive decision, it is now well settled that NEPA itself does not mandate particular results, but simply prescribes the necessary process. . . Other statutes may impose substantive environmental obligations on Federal agencies [see e.g., the Endangered Species Act, 16 U.S.C. 1536(a)(2)] but NEPA merely prohibits uninformed—rather than unwise—agency action.

Methow Valley, at 4501.

3. In requiring a "worst case analysis" the Ninth Circuit stated that although the CEQ's NEPA regulation requiring "worst case analysis" had been superseded by new regulations, the "worst case analysis" was still required ". . . since the regulation was merely a codification of prior NEPA case law." *Methow Valley Citizens Council* v. *Regional Forester*, 833 F.2d 810, 817 (9th Cir. 1987). However, the Supreme Court held that, absent the CEQ regulation requiring the "worst case analysis", NEPA does not mandate that uncertainty in predicting environmental harms be addressed exclusively through a "worst case analysis," and that current NEPA regulation for addressing incomplete or unavailable information (40 C.F.R. 1502.22) is consistent with the requirements of NEPA. *Methow Valley*, at 4502.

4. Finally, the Ninth Circuit applied the "reasonableness" standard to the Corps' decision not to prepare another SEIS and concluded that the Corps had not adequately evaluated the cumulative impacts of the project. However, the Supreme Court held that the Corps decision that the new information was not significant and did not require a new SEIS was primarily a question of fact and that in reviewing such a decision the Court will defer to the agency decision unless it is "arbitrary and capricious." The Supreme Court concluded that the Corps' decision, although perhaps disputable, was not "arbitrary or capricious".

5. In particular, the Supreme Court also indicated in *Elk Creek* that information provided to the Corps during its NEPA evaluation which raises potentially significant issues should be identified as such to the Corps. *Elk Creek*, at 4509. This avoids the tactic of "ambushing" the agency at trial with information not identified as significant during the administrative process.

6. In conclusion, the holdings in *Elk Creek* and *Methow Valley*, emphasize that NEPA is primarily a procedural statute. It is intended to insure informed, environmentally sensitive decisionmaking, but it does not by its terms require substantive environmental obligations. However, these cases do not change the requirement that the Corps continue to prepare NEPA documentation that thoroughly addresses, among other things, the issues of mitigation (see 40 C.F.R. Sections 1502.14(f), 1502.16(h), 1503.3(d), 1505.2(c), 1505.3, and 1508.20) and incomplete or unavailable information (see 40 C.F.R. 1502.22). Furthermore, in some cases substantive mitigation is necessary to meet the requirements of NEPA. For example, mitigation is required when it is relied upon to avoid the need for an EIS, or when mitigation is included in the EIS and adopted as part of the decision (40 C.F.R. 1505.3). In addition, in many cases mitigation will be required, independent of NEPA, in order to meet the substantive requirements of the Fish and Wildlife Coordination Act (FWCA), 16 U.S.C. 662(b), the EPA's 404(b)(1) Guidelines, 40 C.F.R. 230, the Water Resources Development Act of 1986, Public Law 99-662, or the Endangered Species Act, 16 U.S.C 1535.

LANCE D. WOOD,
Assistant Chief Counsel, Environmental Law and Regulatory Programs.

BONNEVILLE NAVIGATION LOCK, OREGON

Senator HATFIELD. Now, one other question I have relates to Bonneville Navigation Lock. Now, Chairman Johnston was questioning you about studies and studies and studies. On page 17 of your statement, you speak about the construction costs of the Bonneville Lock being reestimated, and that the total cost for that project, which was first authorized in 1986 at $191 million, in the reestimate was jumped to $237 million.

I understand that another reestimate is in process which could, according to preliminary information, exceed the project's original cost by 120 percent to the level of $309 million.

Now, since that is a 62 percent increase over the threshold of the original cost, this will create, I believe, a need for reauthorization of the project. Is this correct?

General KELLY. Yes, sir. Senator, if I could——

Senator HATFIELD. Have you informed the authorizing committee of this possibility or probability?

General KELLY. We have just determined that, in fact, we do have a price increase which exceeds the section 902 statutory limitation of 20 percent. We have requested our North Pacific Division to put together a post-authorization change, which will be forwarded to Washington here shortly, for review, by the Secretary's office, OMB, and Congress. That is being worked.

Senator HATFIELD. Other than asking you why these extraordinary, extraordinary increases, let me ask you also to respond to those who have felt that maybe we are now in a strategy of delay, and ask you who authorized or who ordered the last reestimate and why have there been so many reestimates in such a relatively short period of time?

General KELLY. The answer to that, Senator, is that we had a poor estimate to start out with.

Senator HATFIELD. Why?

General KELLY. There were three major changes that occurred. One was we had to redesign a large retaining wall, because we found out that it was inadequate and that caused a substantial increase. We also found out there was a Union Pacific Railroad relocation that was a lot larger than we originally had anticipated when we entered into negotiations with the railroad. Third, to improve the efficiency of the lock, we found out that we had to reorient the channel upstream. Adding all of those three changes to the project caused the large increase.

Now, I might point out that with the assistance of Secretary Page, we have implemented—and I am talking now not for just this specific project, but projects Corps-wide—an entirely new system for putting together our cost estimates. The system requires far more detail, and is far more comprehensive, so that our initial cost estimates, what we call baseline cost estimates, will be the ones that we are going to have to live with. We are looking forward to their being correct in the first place.

Senator HATFIELD. Will you be able to continue the project while you are going through this reauthorization?

General KELLY. Yes, sir; I believe there are one or two contracts that we will award which are fairly minor. Those we probably will be able to handle. But we will not be able to award the major lock contract, which was to have taken place this fall, until we get the project reauthorized. So that particular contract is going to have to be delayed.

Senator HATFIELD. How will that affect the completion date that has already had a year's slippage?

General KELLY. Sir, I cannot tell you right now. We have asked our North Pacific Division to come in with a new schedule.

Assuming that funds are available, the present schedule for having the lock open to traffic in 1993 can still be maintained. This is also contingent upon project reauthorization by December 1989 at an estimated project cost of $309 million.

Senator **Hatfield**. Senator Burdick, as chairman of the authorizing committee, I want to use this platform to give you preliminary notice of our great need to have your support in getting the reauthorization as quickly as possible.

Senator **Burdick**. The need is noted.

Mr. **Doyle**. That is particularly important, because the answer to your question is that the project will be able to go forward or not, depending on how quickly the authority problem is cured. If it is cured quickly, the problem will be solved. If it is not, then our current policy would have us awarding no new contracts, and taking steps to shut the project down until the statutory problem is cured.

Senator **Hatfield**. As I understand, you had the initial estimate, and, then, in the preparation of your fiscal year 1990 budget, you had another estimate on which you base the budget request. Now I understand that you are in a third reestimate that is subsequent to what you offered in your 1990 budget. Is that currently going on? Is there that third?

Mr. **Page**. Yes, we do have a refined estimate. We have to have a realistic estimate and that is the cost to completion. So inflation was added in to completion, is that right?

General **Kelly**. Yes, sir; our North Pacific Division has used the new system of cost-estimating that has been promulgated Corpswide, along with the appropriate inflation rates through the construction, to develop the new cost estimate that we have.

Senator **Hatfield**. The frustration, I guess, you can expect to hear from many sources. But, first of all, what did you do to the engineers that gave you that erroneous, outrageously inadequate, improper, ill-prepared first estimate? Are they still out there practicing engineering in some role or did you discipline them? Were they court martialed? What did you do to those first engineers?

Senator **McClure**. They are on the promotion list.

Senator **Hatfield**. It really bothers me that you say they were so far off. Then you come along to prepare this year's budget under consideration today, using another system, which jumped the estimate up to $237 million, and now you tell me that this is now outdated, that you are using yet another estimate system going on that could easily jump it up to $309 million.

When does this ever stop? When do we ever reach a decision on what the true estimate is? If Senator Johnston feels frustrated about studies on wetlands, my Lord, this is costing us a hell of a lot of money every time you make an estimate.

Mr. **Page**. I understand your frustration, Senator, because when I assumed this position, coming from the private sector, I understood, the management control that it required in order to assure accurate cost estimates and adherence to schedule. That is what we were discussing a minute ago, our new intiatives which have resulted in a total reevaluation of the management procedures in the Corps. Under these procedures, when we give an estimate, that should be the final estimate.

Our goal is that, in the future, whenever you get an estimate here, that is the one we will live with. We have got to be up front about total project costs. It is essential that we have a better system for estimating costs than we had in the past, and we are putting that system into effect.

Senator HATFIELD. Will you sign this next estimate in blood? Will you be personally liable for anything over that estimate that eventually occurs?

Mr. PAGE. I can guarantee you, Senator, since coming to the Government, that if I were, I would not have the money to pay it anyhow.

Senator HATFIELD. I ask my colleagues' pardon for getting a little bit over my time on this issue, but it really is such an important project, and to maintain the schedule of that project is obviously becoming increasingly important. But I also will defer my concern about fisheries to my colleague, who is more of an expert than I, from Idaho.

Senator JOHNSTON. Chairman Byrd?

LEVISA–TUG FORK PROJECT, WEST VIRGINIA

Senator BYRD. General Hatch, I would like to talk with you briefly about Matewan, WV. It is my understanding that the Corps has budgeted $2.3 million for structural activities and $250,000 for nonstructural work in Matewan in fiscal year 1990. Is that correct?

General HATCH. Senator, I would have to provide that exact figure for the record, if I may.

CAPABILITY FOR MATEWAN ELEMENT

Senator BYRD. Can you tell the subcommittee what your capability is to accelerate the Matewan project in fiscal year 1990?

General HATCH. Sir, I have no approved capability beyond the budgeted amount.

Senator BYRD. You don't know what the budget amount is?

General HATCH. Sir, let me provide you an answer: $2.3 million in our fiscal year 1990 submission have been earmarked for the Matewan element to continue real estate acquisition, and engineering and design. An additional $5 million in the fiscal year 1990 capability has been approved for the Matewan element to advance completion of structural and nonstructural measures by 6 months.

Senator BYRD. Sir, you have a capability for an additional $5 million——

General HATCH. That is correct, sir.

Senator BYRD [continuing]. To advance structural and nonstructural work by 6 months.

General HATCH. Yes, sir.

CAPABILITY FOR FLOODPROOFING FEATURE

Senator BYRD. Now, what about advancing floodproofing activities by 6 months as well? How much additional money?

General HATCH. Sir, the $5 million that I indicated is the limit of my approved capability.

Senator BYRD. How much would be needed——

General HATCH. Sir, that would be perhaps included in the nonstructural work; I am not certain.

Senator BYRD. I am advised that it is not, that it is separate and that it is $3 million. This is in your approved capability statement.

General HATCH. Senator Byrd, if I may, again, I will verify our capability figure and for what purposes that capability would either accelerate the project and provide those details for the record.

[The information follows:]

LEVISA AND TUG FORKS OF THE BIG SAND RIVER AND UPPER CUMBERLAND RIVER, KY, VA, AND WV

MATEWAN, WV

Our total capability for the Matewan element is $7.85 million of which $4.6 million is for the Central Business District and Mate Creek Community Development and Housing Site which includes both structural and nonstructural work and $3.25 million is for Floodproofing which is nonstructural work and includes raising of homes and buy out of homes which is uneconomical for raising. The proposed fiscal year 1990 budget includes $2,550,000 for the Matewan element. The capability funding would advance completion by 6 months for both the Mate Creek Community Development and Housing Site Phase II construction and Floodproofing work.

EFFECT OF FUNDING AT CAPABILITY AMOUNT

Senator BYRD. Very well, if you would. I believe your own statement, however, indicates that you do not have the capability of accelerating the project and advancing the floodproofing activities. The appropriation needed would be $8 million.

Would the additional appropriation of these funds this year cause the overall Matewan construction costs to increase? In other words, if there were approriated the additional $8 million, to meet your stated capability for the year, would that cause the overall construction cost to increase?

General HATCH. It should not, sir. Normally, the funding of the capability simply brings forward into the current budget year that amount that normally would be spent in a subsequent year.

Senator BYRD. So it would probably decrease due to the more efficient use of your contractor, equipment, and less time for inflation to affect the total.

General HATCH. For that specific project, in isolation; yes, sir.

RATIONALE FOR NOT BUDGETING FOR CAPABILITY AMOUNTS

Senator BYRD. All right. Let me ask you this question then. If the costs would not increase and the engineers have that admitted capability, why did not the Corps request these additional funds?

General HATCH. Sir, many of our projects are scheduled on what, at the time, seems to be an optimum schedule and once locked into the schedule, we are sort of stuck with it. In order to make the project and all the other things we want to do in the ensuing years affordable, sir, once we lock into a funding stream for that project, we would normally keep it that way.

Each year, we look at each project. We do, in anticipation of possible questions by Congress, determine whether there would be capability, considering that project in isolation from all others, and, in some cases, we find that, at that point in time, in the history of that project, we could accelerate it.

Senator BYRD. I urge you to do all you can administratively to accelerate the project and the other West Virginia, Tug Fork projects as well. I will be working to secure the necessary additional funds, for which you have the capability and we will both be working together, then, to help citizens of Matewan.

It is my understanding that the Corps of Engineers has requested adequate funds to accomplish its full capability for the remainder of the West Virginia portion of the Tug Fork project. It is my understanding that you have also done so for the locks and dams at Winfield, Gallipolis, Point Marion, and Gray's Landing. Is that correct?

General HATCH. Two, sir, are new starts, and, yes, I believe it is a correct assumption that those figures in the budget reflect appropriate amounts, rather than any additional capability.

Senator BYRD. May I have your assurance that if it becomes possible to accelerate work at these sites, and if funds are available for reprogramming, the Corps will, in fact, seek to make the necessary funds available?

General HATCH. Sir, if more funds become available, we would certainly consider these projects along with others that might have demand for available funds.

I think I would be remiss to advise you at this time that any available moneys would go directly to these projects. We could have deficiencies in some projects, and in order to maintain the momentum, we would have to fund them. We would certainly consider your projects very seriously as possible recipients of additional funds.

PETERSBURG AND MOOREFIELD, WV

Senator BYRD. The Corps has requested fiscal year 1990 funding totaling $542,000 to complete the feasibility study and to initiate project planning, engineering, and design for Petersburg, and $238,000 for similar purposes in Moorefield. Do these amounts represent the Corps' full project capability for Petersburg and Moorefield?

FISCAL YEAR 1990 CAPABILITIES FOR WEST VIRGINIA PROJECTS

Mr. CLUFF. Senator, we will be glad to provide a complete list of capabilities in the State of West Virginia for the record on all our projects.

[The information follows:]

FISCAL YEAR 1990 FUNDING CAPABILITIES

[Amounts in thousands]

Study, State, and congressional districts	Type	Estimated Federal cost	Amount included in President's budget	Study capability	Purpose of additional capability	House	Senate
NORTH ATLANTIC DIVISION							
AUTHORIZED STUDIES							
Jennings Randolph Lake reallocation, Maryland (District 6) and West Virginia (District 2)	(RCP)	$400	$150	$150	No additional requirement	$75	$150
Moorefield, West Virginia (District 2)	(FDP)	622	88	88	Complete study	88	88
Petersburg, West Virginia (District 2)	(FDP)	655	42	42	Complete study	42	42
Potomac River Basin (flood damage prevention), District of Columbia (District 1); Maryland (Districts 6 and 8); Pennsylvania (Districts 9, 12, and 19); Virginia (Districts 6, 7, and 10); and West Virginia (District 2)	(FDP)	[1] 210		210	Initiate and complete reconnaissance phase of study		
Potomac River Basin, District of Columbia (District 1); Maryland (Districts 6 and 8); Pennsylvania (Districts 9, 12, and 19); Virginia (Districts 6, 7, and 10); and West Virginia (District 2)	(FDP)	[1] 180			Fully funded		
Upper James River Basin, Virginia (Districts 5, 6, and 9); and West Virginia (District 2)	(FDP)	[1] 250	250	250	Initiate and complete reconnaissance phase of study	125	125
PRECONSTRUCTION ENGINEERING AND DESIGN							
Moorefield, West Virginia (District 2)	(FC)	2,000	150	150	No additional requirement	75	150
Petersburg, West Virginia (District 2)	(FC)	2,000	500	500	No additional requirement	250	250
OPERATION AND MAINTENANCE							
Cumberland, Maryland (District 6) and Ridgeley, West Virginia (District 2)	(FC)		72	72	No additional requirement	72	72
Jennings Randolph Lake, Maryland (District 6) and West Virginia (District 2)	(FC)		1,243	1,243	No additional requirement	1,299	1,299
OHIO RIVER DIVISION							
AUTHORIZED STUDIES							
Kanawha River basin comp (auth rpts); North Carolina (Districts 5 and 10); Virginia (Districts 5 and 9); and West Virginia (Districts 2, 3, and 4) (parent).	(COM)	6,769			Fully funded		
Kanawah River navigation, West Virginia (District 3)	(N)	7,785	715	715	No additional requirement	715	715

Little Kanawha River basin, West Virginia (District 3)	(FDP)	1,100	50	50		50	50
Middle Island Creek basin, West Virginia (Districts 1 and 3)	(FDP)	250		250	Initiate feasibility level investigations		
Mon-Yough River basin, Maryland (District 6); Pennsylvania (Districts 14, 20, and 22); and West Virginia (Districts 1 and 2).	(FDP)	9,117	450	450	No additional requirement	450	450
Monogahela River basin, Maryland (District 6); Pennsylvania (District 22); and West Virginia (Districts 1 and 2).	(FDP)	[1] 500	200	200	Complete reconnaissance phase of study	200	200
Ohio River main stem, Kentucky (Districts 1, 2, 3, 4, 6, and 7); Illinois (District 22); Indiana (Districts 8 and 9); Ohio (Districts 1, 2, 6, 10, and 18); Pennsylvania (Districts 14, 18, and 22); and West Virginia (Districts 1 and 3).	(FDP)	18,320	700	1,000	Advance completion of the upper Ohio River interim by 4 months.	700	700
West Virginia waterfront dev study, West Viginia (Ohio River MI 40–317)	(SPE)	1,500			Federal accomplishment not in accord with current priorities.	250	(2)
PRECONSTRUCTION ENGINEERING AND DESIGN							
Cabin Creek LPP, West Virginia (Disrict 3)	(FC)	1,500		500	Continue PED		
Charleston waterfront park, West Virginia (District 3)	(FC)	500			PED will continue with available funds		
Island Creek basin in and around Logan, WV (District 4)	(FC)	1,600	200	200	No additional requirement	200	200
Oceana LPP, West Virginia (District 4)	(FC)	1,200			Lack of recent expression of local interet		
CONSTRUCTION PROJECTS							
Gallipolis locks and dam, West Virginia (District 3); and Ohio (Distict 10)	(N)	[3] 367,000	(C) 78,900	(C) 78,900	No additional requirement	78,900	78,900
Kanawha River, Charleston, WV (District 3), (strbk erosion 86 Act.)	(FC)	330	(C)	(C)	Engineering and design will continue with available funds		
Kanawha River, St. Allbans, WV (District 3), (strbn erosion 86 Act.)	(FC)	240	(C)	(C)	Engineering and design will continue with available funds		
Levisa and Tug Forks and upper Cumberland River, West Virginia (Distict 4); Virginia (District 9); and Kentucky (District 7).	(FC)	760,000	(C) 25,000	(C) 61,300		56,000	51,200
					Advance completion of floodproofing at Matewan by 6 months.	3,000	
					Advance completion of Matewan structural and nonstructural measures by 6 months.	2,300	
					Advance completion of South Williams—Structural and nonstructural measures by 6 months.	5,000	
					Continue construction of structural and nonstructural measures at Barbourville.	6,000	
					Continue construction of structural and nonstructural measures at Harlan.	20,000	
					NOTE: The administration's review of this project has identified economic and/or policy concerns.		
Point Marion, lock and dam 8, Monongahela River, Pennsylvania (District 22); and West Virginia (District 2).	(N)	96,400	(C) 17,900	(C) 17,900	No additional requirement	17,900	17,900
Stonewall Jackson Lake, WV (District 3)	(FC)	[3] 203,000	(C) 20,800	(C) 20,800	No additional requirement	13,434	13,434

FISCAL YEAR 1990 FUNDING CAPABILITIES—Continued

[Amounts in thousands]

Study, State, and congressional districts	Type	Estimated Federal cost	Amount included in President's budget	Study capability	Purpose of additional capability	House	Senate
Winfield lock and dam, West Virginia (District 3)	(N)	a 203,000	(C) 20,800	(C) 20,800	No additional requirement	20,800	20,800
OPERATION AND MAINTENANCE							
Beech Fork Lake, WV (District 4)		(FC)	613	613	No additional requirement	632	632
Big Sandy Harbor, KY (District 7) and West Viginia (District 4)	(N)		1,000	1,000	No additional requirement	1,000	1,000
Bluestone Lake, WV (District 2) and Virginia (District 9)	(FC)		928	928	No additional requirement	1,043	1,043
Burnsville Lake, WV (District 3)	(FC)		1,0644	1,064	No additional requirement	1,124	1,124
East Lynn Lake, WV (District 4)	(FC)		974	974	No additional requirement	999	999
Elk River Harbor, WV (District 3)	(N)				No additional requirement		
Elkins, WV (District 2)	(FC)		12	12	No additional requirement	12	22
Kanawha River locks and dams, West Virginia (Districts 2 and 3)	(N)		7,765	8,300		7,765	7,765
					Replace bridge cranes—London and Marmet Locks	255	
					Replace motor starting equipment and crane controls—Marmet locks.	160	
					Purchase standby power—London and Marmet lock	120	
Monongahela River, Pennsylvania (Districts 20 and 22) and West Virginia (District 2)	(N)		11,315	11,454	Construct new landwall building at lock 4	11,315	11,315
Ohio River locks and dams, Kentucky (Districts 1, 2, 3, 4, and 7); Illinois (District 22); Indiana (Districts 8 and 9); Ohio (Districts 1 and 2); Pennsylvania (Districts 4, 14, 20, and 22); and West Virginia (Districts 1, 3, and 4).	(N)		47,026	49,510		47,026	47,026
					Install high mast lighting system—Newburg	350	
					Remove L/D 36 land wall	128	
					Unwater and repair lock chamber—Hannibal	1,100	
					Prepare plans and specifications for power unit—Montgomery.	56	
					Fabricate tainter valves—New Cumberland, Pike Island, Hannibal.	150	
					Purchase two culvert valves—Greenup and Belleville	700	
Ohio River open channel work, Kentucky (Districts 1, 2, 3, 4, and 7); Illinois (District 22); Indiana (Districts 8 and 9); Ohio (Districts 1 and 2); Pennsylvania (Districts 4, 14, 20, and 22); and West Virginia (Districts 1, 3, and 4).	(N)		4,319	4,319	No additional requirement	4,319	4,319
Portsmouth Harbor, OH (District 6) and West Virginia (District 4)	(N)				No additional requirement		

R D Bailey Lake, WV (District 4)	(FC)	1,324	1,324	No additional requirement	1,364	1,364
Stonewall Jackson Lake, WV (District 3)	(FC)	682	682	No additional requirement	682	682
Summersville Lake, WV (District 3)	(FC)	1,003	1,003	No additional requirement	1,063	1,063
Sutton Lake, WV (Districts 2 and 3)	(FC)	1,194	1,194	No additional requirement	1,269	1,269
Tygart Lake, WV (Districts 1 and 2)	(N)	626	626	No additional requirement	641	641
Charleston, WV, riverfront					(4)	250

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[1] Reflects reconnaissance phase cost estimate only.

[2] Senate addd under O&M.

[3] Cost estimate includes an allowance for inflation through the construction period.

[4] House added under GI.

Note.—The fiscal year 1990 Reagan budget for the civil works program of the Army Corps of Engineers was based on that administration's support for high priority, economically justified planning, construction, and operation and maintenance of new and ongoing flood control and navigation projects. To allow for these priorities and meet deficit targets, funding was reduced or excluded for other, lower priority activities.

The Bush administration did not propose any specific changes to the Reagan administration's budget for the Army civil works program. Therefore, the civil works budget is included in the $136 billion residual freeze category, and as a result, is subject to negotiation with Congress. While project and study capabilities reflect the readiness for additional work, any increase above the fiscal year 1990 Reagan budget level for a project or study would require a corresponding offsetting reduction in other projects or programs within the residual freeze category so that deficit-reduction targets can be met.

Budget and capability amounts reflect Federal funds, except for projects with costs allocated to navigation, for which the amounts shown include non-Federal funding. The non-Federal funds are to be derived from fees to be deposited in and appropriated from the Inland Waterways and Harbor Maintenance Trust Funds.

Senator **Byrd**. General Hatch, you and I have been over to Petersburg. We have been to Moorefield. I think you might anticipate some questions like these when you come before the subcommittee and I do not like these answers for the record. I prefer to have them here because it might generate further questions.

Let me ask you again. I gave you the amounts. The Corps has requested fiscal year 1990 funding totaling $542,000 to complete the feasibility study and to initiate project planning, engineering and design for Petersburg, and $238,000 for similar purposes in Moorefield. Do you think that the amounts represent the Corps' full project capability for Petersburg and Moorefield?

General **Hatch**. Sir, we probably could spend more money. If I may, and I apologize for my inability to respond specifically to the amounts that you requested, we will provide that for the record, sir.

SCHEDULES FOR PETERSBURG AND MOOREFIELD PROJECTS

Senator **Byrd**. All right. Is there anything the Corps can do to expedite the completion of the feasibility study and the planning, engineering, and design of the these two flood control projects?

General **Kelly**. Yes, sir; we will certainly take a look at capabilities and provide you with that information.

[The information follows:]

No, sir; we are proceeding as rapidly as we can on these projects and we have asked for the full amount of funds that we could use. We have discussed, with the local sponsor's staff, the possibility of accelerating the design of the Petersburg project, but we are unable to accelerate the feasibility report, and cannot use additional funds in fiscal years 1989 or 1990.

Senator **Byrd**. Would you send to me the original project schedule, the new fast-track project schedule? And would you also indicate what activities would be shortened to achieve the faster schedule?

General **Kelly**. Yes, sir.

I will furnish you these projects' schedules. Any fast-track schedules will have to await the selection of the preferred alternatives, which should take place this summer for Petersburg.

IMPACT OF BUDGET CUTS FOR RECREATION SITES IN WEST VIRGINIA

Senator **Byrd**. Just one further question having to do with the subject of recreational sites, which the chairman and Senator Hatfield have already alluded to. Your May 2, 1989, letter, which I have just seen this afternoon, indicates that the Corps of Engineers, in an effort to save money, will, in the most compelling cases, close certain recreation facilities.

There had been a letter of February 23, General Hatch, in which it was indicated that shortfalls in the fiscal year 1990 budget request for operations and maintenance would cause the Corps of Engineers to close a number of recreational sites, including, I believe, about eight sites in West Virginia.

It is my understanding you have a number of revised criteria which would be used to determine which recreation sites would be closed. Under the revised criteria, will any of the West Virginia recreation projects be closed or partially closed?

General **Hatch**. Sir, it is quite possible, it would not be the extent of closure that we had originally announced. Our intent, as soon as our review, in coordination with the field, is complete is to inform you of any locations where we would intend to curtail services or close facilities.

Senator **Byrd**. So you do not have a list today?

General **Hatch**. We do not have a list now, sir.

Senator **Byrd**. When will you have such a list?

General **Hatch**. It is to be here by early next week, sir.

Senator **Byrd**. Well, you have a long way to go to convince me that these closures are necessary in West Virginia, and I believe that sending a letter only a day before the subcommittee hearing is poor timing for a matter of this importance. I will look forward to receiving your list.

[The information follows:]

RECREATIONAL CLOSURES

Two West Virginia sites remain under consideration for closure. Final recommendations will be made after consultations with local and Congressional interests. The two sites are as follows:

State	Recreation area	Project
West Virginia	Buffalo Creek	Pike Island Locks and Dam.
West Virginia	Long Branch Overlook	R.D. Bailey Lake.

Department of the Army,
Office of the Assistant Secretary,
May 2, 1989.

Hon. Robert C. Byrd,
Chairman, Committee on Appropriations, U.S. Senate,
Washington, DC.

Dear Mr. Chairman: This is in further reference to my letter of February 23, 1989, concerning the January 9 budget proposals to reduce operation and maintenance (O&M) funding for Army Corps of Engineers recreation areas and low-use commercial and recreational harbors. In that letter, I advised you that I had requested the Corps to take a closer look at the recreation closures and the navigation cuts, in order to lessen impacts of O&M budget reductions. The overall approach the Corps is pursuing involves:

—Implementation, across-the-board in the O&M account, of a combination of intensive management actions and deferral of maintenance to achieve the required budget savings in fiscal year (FY) 1990;

—Adoption of revised criteria for evaluating the fiscal year 1990 O&M program which will reduce to only the most compelling cases the number of recreation closures and harbors that would not be maintained; and

—Seeking a broad range of measures to maintain service levels that do not rely on Corps funds and manpower.

The specific application of these proposals—and they are budget neutral with respect to budget authority and outlays in fiscal year 1990 and the outyears—to recreation areas and to harbors in fiscal year 1990 is presented in the enclosure. While they will help maintain services within the fiscal year 1990 budget amounts, we are developing a forward-looking posture for the continued O&M of recreation and harbor facilities.

I am convinced that, given the resources expected to be available to the Corps, we should further pursue O&M of existing facilities by local governments and the private sector, consolidations to reduce costs, and even consider leasing for some forms of restricted and tightly controlled residential development where it can contribute to continued O&M of recreation facilities.

The Department of the Army, moreover, supports enactment, in fiscal year 1989, of legislation broadening the authority of the Corps of Engineers to collect recreation user fees and making these fees available as means of funding recreation O&M

in fiscal year 1991 and beyond. Because the receipts from these fees would not become available until fiscal year 1991, at the earliest, we have not identified any increase in receipts as part of the revised fiscal year 1990 proposal.

We cannot emphasize too strongly the fact that continued availability of recreation opportunities at Corps projects would be greatly strengthened by the demonstration of public commitment inherent in broadening user fees.

I hope you find useful this status report on efforts by the Army Corps of Engineers to revise the January 9 O&M budget recommendations.

Sincerely,

Robert W. Page,
Assistant Secretary of the Army (Civil Works).

Department of the Army, Corps of Engineers (Civil Works)—Operation and Maintenance (O&M) [1] Revision of January 9 Budget Proposal for Fiscal Year 1990

O&M Budget Reallocation: Procedure

1. Corps Headquarters will add back to Division O&M budgets all recreation areas and navigation harbor projects that were proposed for closure or deletion of funds in the January 9 budget.

2. Corps Headquarters will provide Divisions with an initial reallocation of the O&M budget which reflects revised criteria for recreation area closures, revised criteria for cessation of harbor maintenance, and deferral of maintenance. Through exploitation of the potential for intensive management actions, carried out throughout the budget year, divisions will adjust their programs to reduce adverse consequences.

3. Divisions will reevaluate O&M projects, specifically identifying reductions at project level in accordance with the revised criteria and deferral of maintenance. They will report to the Director of Civil Works the proposed revisions to budgeted amounts for each project and the nature and impact of the revision, including a revised list of candidates for closure and for deletion of navigation maintenance funding.

4. Divisions will consult with respective local interests and Congressional delegations with the goal of producing an acceptable plan for final allocation of the amounts budgeted for O&M.

5. The Army will furnish the Subcommittees on Energy and Water Development a final recommendation for allocation of the budgeted O&M funds.

Specific measures

REVISED CRITERIA

Recreation areas.—A limited number of areas remain as logical candidates for closure. However, the goal is to effect these changes without diminishing the overall recreational opportunities afforded to the public. We will not close any sites until consultation has been concluded with the respective local officials and the Congressional delegation.

The basic criteria the Corps is using as a starting point to identify potential sites are:

—low use (less than 2,500 visitor days per year);
—similar alternative recreation nearby (five miles);
—high cost considering the low use (more than $10,000 annually);
—few facilities (less than 10 campsites or picnic stations); and
—heavy vandalism.

Once the specific areas meeting these criteria are identified by the District Engineer and approved by the Division Engineer, the results will be reported to the Director of Civil Works, who will review them and provide further guidance as necessary to meet local conditions in identifying about 100 candidate sites nationwide. We are limiting candidates for closure to sites which have questionable justification for remaining in operation. This action should lead to an estimated savings of approximately $1 million, which is significantly less than envisioned in the January 9 budget. The 100 sites will be discussed by the Corps with local interests and Congressional delegations before final decision. During the discussion, the Corps will consider all of the possible solutions, to include takeover of operation and maintenance of sites by State and local governments.

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[1] O&M includes both the Operation and Maintenance, General, account and the Flood Control, Mississippi River and Tributaries (MR&T), Maintenance category.

Boat harbors.—The Corps has reviewed the criteria used in selecting the projects for which navigation maintenance funds were deleted from the budget. They found that the January 9 criterion, less than 25,000 tons of commerce, did not make adequate allowance for other factors which influence the establishment and maintenance of a channel or harbor. The revised criteria are more sharply focused on the impact of the role of the harbor in the economy. We are also taking great care to insure that communities, such as some of the Pacific Islands and Alaska, are not deprived of essential means of transportation, and that necessary Federal functions, such as the Coast Guard's search, rescue and interdiction mission, are not adversely affected.

The revised criteria developed by the Corps for consideration of deletion of harbor dredging or maintenance during fiscal year 1990 are:

—recreation harbors with low economic impact;

—very high cost commercial harbors (costs per ton greater than 100 times the national median);

—availability of alternative transportation; and

—no impact on essential Federal functions such as Coast Guard or Defense installations.

Final decisions regarding these harbors will be made by the Corps following a procedure similar to that to be used on recreation sites. Anticipated savings of approximately $8 million should be realized for deleted harbor maintenance of two dozen projects, again, much less of a reduction than was envisioned in the January 9 budget. As with the recreation areas, we would discontinue maintenance only after coordination with local officials and the Congressional delegations.

DEFERRAL OF MAINTENANCE AND INTENSIVE MANAGEMENT ACTIONS

The proposed reinstatement of funds for some recreation areas and boat harbors will necessitate reductions elsewhere, specifically, deferral of maintenance, in order to maintain the same total amount requested for O&M on January 9. As mentioned above, some possible closures and deleted navigation projects should yield approximately $1 and $8 million, respectively; further savings from deferral of maintenance in the range of $70–$75 million thus will need to be derived.

Along with candidates for closures and deleted harbor maintenance, each division will reexamine its entire O&M program, focusing on deferrable maintenance work and other items of lower priority. This will include a careful review of requirements for expenditures for dams, repair of navigation structures, roads, equipment, disposal facilities, engineering studies, water control, instrumentation, hydropower, safety, real estate, energy and security. The deferral is unavoidable, notwithstanding recognition that such action puts off requirements until the future when it will be more costly and will lead to further deterioration.

Throughout the budget year, however, divisions will adjust their programs to reduce the adverse impacts of the deferred maintenance by means of intensive management actions including: (a) reductions in the number and/or scope of activities at those recreation areas that remain open, such as frequency of trash collections, interpretive services, and work shifts; and (b) reexamination of all harbors for practicability of modifying navigation channel dimensions consistent with current usage.

OTHER ALTERNATIVES

While the above proposals will help us out of the fiscal year 1990 budget dilemma, we need to develop a forward-looking posture for the continued O&M of recreation and harbor facilities. Given the resources available to the Corps in a tight deficit reduction environment, we need to be looking at O&M of existing facilities by local governments and the private sector, consolidations to reduce management costs, and even consider leasing for some forms of restricted and tightly controlled residential development where it can contribute to continued O&M of recreation facilities. We will encourage public participation planning at the local level and consult with Congressional delegations and Subcommittees as we are studying this concept.

USER FEES

We continue to propose that Congress enact, in fiscal year 1989, a user fee system. The legislation provides for expanded authority to impose fees for day use as well as overnight camping. The resultant additional receipts would be credited to the Special Recreation Use Fee (SURF) account in accordance with Section 4 of the Land

and Conservation Act of 1965; but the funds would not be available for appropriation and expenditure until at least fiscal year 1991. Enactment of this new user fee legislation in fiscal year 1989, would make available for appropriation an estimated $20 million annually, beginning in fiscal year 1991.

COMPARISON OF PROPOSALS

A comparison of the revised proposal with the proposal of January 9 is contained on the table that follows.

ARMY CORPS OF ENGINEERS
OPERATION AND MAINTENANCE
COMPARISON OF JANUARY 9 BUDGET AND REVISED PROPOSALS
FOR RECREATION AREAS AND BOAT HARBORS

JANUARY 9 BUDGET PROPOSAL SUBMITTED FOR FY 1990		REVISED BUDGET PROPOSAL SUBMITTED FOR FY 1990	
RECREATION AREAS 1/	BOAT HARBORS	RECREATION AREAS 1/	BOAT HARBORS
CLOSURES	NO HARBOR MAINTENANCE	DEFERRAL OF MAINTENANCE AND INTENSIVE MANAGEMENT ACTIONS	
>654 Recreation areas proposed for closure or partial closure (25 % of all Corps Recreation Sites)	>74 Low-use commercial and recreational harbors would no longer be maintained and an additional 542 projects would not be eligible for maintenance if a need for dredging should arise	Implementation across-the-board in the O&M, General, program of a combination of deferred maintenance and intensive management actions including recreation facilities and harbor maintenance Total est. cost savings: $70 - 75 million	
		CLOSURES	NO HARBOR MAINTENANCE
>Criteria: o Operational efficiency o Accessibility & location o % of project visitation o Alternatives available o Socioeconomic impacts o Cost and feasibility of closure	>Criteria: o Less than 25,000 tons annual commerce	>Approximately 100 Recreation areas would be closed >Criteria: o Less than 2500 visitor days per year (Low use) o Similar alternative site within 5 miles of low use area o Low use areas costing $10,000 or more annually o Less than 10 camp sites or picnic areas at low use area o Heavy Vandalism	>Approximately two dozen projects would be candidates for deletion of dredging or maintenance >Criteria: o Recreation harbors with low economic impact o Maintenance costs greater than 100 times national median o Alternative transportation available o No impact on Coast Guard or defense installations
>Districts independently identified sites	>No discretion at District level	>Districts, Divisions and Headquarters involved in the process of identifying candidates for closure	>Districts, Divisions and Headquarters involved in the process of identifying candidates for deletion
>Total est. cost savings from proposed closures: $34 million 2/	>Total est. cost savings from proposed deletion of maintenance: $49 million	>Total est. cost savings from proposed closures: Approximately $1 million	>Total est. cost savings from proposed deletion of maintenance: Approximately $8 million
Total est. savings: $83 million 2/		Total est. savings: $83 million 2/	

1/ Includes proposed added user fees but revenues would not be available until FY 1991.

2/ Excludes $1 Million in Flood Control, Mississippi River and Tributaries (MR&T) Maintenance Category.

COLUMBIA RIVER FISH BYPASS PROGRAM

Senator **Burdick**. Senator from Idaho.

Senator **McClure**. Thank you very much, Mr. Chairman.

Mr. Secretary, you know that we have had an awful lot of discussions and quite a bit of dissension over the last several years over the Columbia River Fish Bypass Program. I am bound to ask a few questions about it, because I think we are still in the middle of this problem, although I am not certain that it is any longer the Corps' problem or the Corps' fault.

There was a period of time when there was substantial disagreement between the Corps and Senator Hatfield and myself over fish bypassing facilities. I think that has been resolved and I appreciate that very much. As a matter of fact, you generated an awful lot of bad publicity out there for yourselves. But I guess I should not object to that because I generated a lot of good publicity.

Fighting you is a very popular thing. You may have seen this bumper sticker. It says "Bypass the Corps." As a matter of fact, this is one of the bumper stickers that we can display here; there are some others out there that are much more direct and pungent, which I would not care to display here today. But I think all the ill will and bad feelings have been overtaken by events. I hope that is true.

SCHEDULE FOR FISH BYPASS CONSTRUCTION

The original fish bypass schedule called for work to be completed by fiscal 1994. I have heard that the delay in spending the fiscal year 1988 money has slipped that schedule into fiscal year 1995 or beyond. On the other hand, I have also heard that the program can be finished on schedule in fiscal year 1994. What can you tell me about when that schedule can be completed under current funding levels and current progress?

ACTION TO RESOLVE SCOPE OF FISH BYPASS WORK

General **Kelly**. Sir, as you know, Secretary Page sent you a letter last summer which described some of the activities that he has taken to solve this problem, one of which was to send out a task force to see if some of the facilities were clearly economically feasible. The task force came back last summer, submitted a report—I believe you have a copy of that—and recommended that, perhaps, at least four of the facilities were economically feasible. The Secretary's staff is in discussions with the OMB on that.

In the meantime, we are going to send out another team, I believe, in June to get with the Northwest Power Planning Council to see if we can improve the chances of accomplishing three things. First, the determination of an appropriate end point, satisfactory to everybody for the long-term Army obligation for mitigation; second, the completion of a spill agreement; and third, continuing budgeting, which, I think, is really the issue that you are after, for those facilities that everybody agrees is part of the long-term obligation. I think that meeting is scheduled out in Portland on June 8.

Senator **McClure**. Does this indicate the Corps is withdrawing its support for the four facilities that you found to be feasible?

General KELLY. No, sir; it does not.

Senator MCCLURE. Does it indicate, then, that the study is directed against the two remaining dams? Or is it a broader study than that?

General KELLY. Well, right now, we are trying to get all the appropriate parties together—clearly including the power and the fishing interests—to see if we can come to an agreement on work to be done, but mainly to find an appropriate end point that everybody agrees to. I think that, to OMB and certainly to Secretary Page's staff, is a very important point.

IDEA FOR RESOLUTION OF SCOPE OF WORK

Senator MCCLURE. First of all, I am not sure I got a different answer than your first answer, and I had asked for a different answer. I will come back to that in just a moment. But is this review really your idea or is it really OMB's idea to have another study?

General KELLY. I would have to defer to Secretary Page or Mr. Doyle on that, but I think everybody is in agreement that we need to meet and see if we can solve the problem.

Senator MCCLURE. Without commenting on that at this point, I would like an answer to my question.

Mr. PAGE. With OMB. The June meeting is with OMB.

Senator MCCLURE. We should revise this bumper sticker to say, "Bypass OMB"?

Mr. PAGE. Bypass OMB.

Senator MCCLURE. There are other ways to phrase that as well.

I am a little bit concerned that we are talking about yet another study. I am also a little bit concerned about the fact that, although the Corps agreed to go forward on four dams—and I appreciate that your initial budget request included money for those four dams—it did not include money for the two dams which you did not consider feasible.

I assume that if this committee and this Congress provide money for all of the dams, including the two that you do not agree should be funded, you will still spend the money. I hope we will not get into another one of those impasses in which Congress gave direction to the Corps, and the Corps said, "We do not agree with you, so we will not do it." Am I correct that if we provide the money, you will spend it?

General HATCH. Sir, we will follow the law. Yes, sir.

Senator MCCLURE. That is new and refreshing and I like the answer. Because we have not always had that answer and I think we should lay it out here very plainly, that the reason you got this kind of publicity out there, is that the Corps did not always follow the law. The Congress got tired of waiting for the Corps to proceed with the bypass program and Congress went ahead and did give some direction, which, for a time, the Corps did not follow.

That is the reason I am asking this question today because I do not want to see us get into that kind of a fight again. It frankly does not reflect any honor on any of us to get into that kind of a scrap.

With respect to the fish barges, I was out last week visiting some of your facilities. I visited the barge construction site and had the opportunity to talk to your personnel and the contractor personnel there. I very much appreciate the courtesy that was given to me and to my staff as we reviewed the progress on those projects. I wish more people had the opportunity to visit some of those sites.

I understand that some of your people are also undertaking a review to see whether or not there are things that we can do in terms of public information to make those sites not only more available, but also more instructional to the public with respect to what we actually do with the fish when we bypass them and transport them downstream. I appreciate that as well.

SALMON RIVER ICE CONTROL PROJECT, IDAHO

Let me ask just one question about the Salmon River flooding problem. We did conduct the frazil ice study this last winter after some delay. The Corps was a little late getting in there. In spite of the fact that we were late, there was an attempt to do some research on the problem. What have you learned?

General KELLY. Sir, we put a boom across the river upstream from the damage site. Preliminary indications were that it has considerable merit. Unfortunately, as you have suggested, we did not get it there early enough. So what we will plan to do now, as part of our section 205 study, is to continue that effort into next winter.

Senator MCCLURE. Do you have enough funding to do that?

General KELLY. Yes, sir; we do.

Senator MCCLURE. So that we will not be limited by funding? I was a little disturbed, and I think you were a little embarrassed, that you were not prepared to get in there early enough this past winter.

General KELLY. What we plan to do is have our Cold Regions Laboratory, which does many projects in support of our districts, use the regular project funding to accomplish the work, and we have enough money to do that.

Senator MCCLURE. So if you have enough money, do you have the plans in place, and if the weather will cooperate, will you be there on time next winter?

General KELLY. Yes, sir.

Senator MCCLURE. Thank you very much, and thank you, Mr. Chairman. I have some additional questions which I will submit for the record.

PREPARED QUESTIONS SUBMITTED FOR RESPONSE

Senator BURDICK. Without objection, they will be included in the record at this point for response.

[The information follows:]

QUESTIONS SUBMITTED BY SENATOR MCCLURE

LOWER COLUMBIA RIVER FISH BYPASS PROGRAM

Question. In its fiscal year 1990 budget submission to OMB, the Corps requested some $4.1 million in funds for fish bypass work at Little Goose, Lower Granite, Lower Monumental, and McNary. Those funds were ultimately not included in the

President's budget request. How did the Corps arrive at that particular budget request?

Answer. The fiscal year 1990 budget request to OMB provided for orderly progress in the fish bypass facilities at the Little Goose, Lower Granite, Lower Monumental and McNary projects. The estimate of funds required was based in the engineering analysis that had been accomplished at that point in time.

Question. Why so low?

Answer. At the time the fiscal year 1990 budget was being prepared, the North Pacific Division was looking at an inexpensive way to raise the gates in the slots. The approach was to raise the gates and dog them. This procedure would negate an existing gate closure criteria of 10 minutes. In order to keep this criteria, we will have to use longer hydraulic cylinders similar to the current system but only larger.

Question. According to the Northwest Power Planning Council, $9.9 million is the figure for the amount of funding that the Corps could effectively use for fiscal year 1990. Is this an accurate figure?

Answer. Sir, $9.9 million can be effectively used in fiscal year 1990; $6.1 million would be utilized to initiate new construction contracts, primarily gate raise contracts at Little Goose and Lower Granite, a prototype fish screen contract at McNary, and fish loading and barge moorage expansion contracts at Lower Granite; $3.8 million would be used to continue design and supervision and administration work on other facilities.

Question. If the Congress appropriates these funds, will the Corps spend these funds as directed by Congress?

Answer. Yes, sir; our fiscal year 1988 and 1989 activities on the fish bypass program are as directed by Congress and future funds will be used as directed.

Question. For example, I notice that the Corps did not request funds for projects at Ice Harbor and The Dalles. If Congress appropriates funds for these projects, will the Corps spend the funds as Congress directs?

Answer. Yes, sir.

Question. In your oral response to this question, General Hatch, you said, I believe, "We will obey the Law." By "the Law," I am assuming that you mean both bill language and the Committee report language providing detailed directives on the disposition of appropriated funds. Am I correct in that assumption?

Answer. Certainly the Army intends to comply with bill and committee report language pertaining to the fish bypass system, yes.

Question. Does the Corps plan to request funding for the fish bypass system in fiscal year 1991?

Answer. We are in the process now of developing our fiscal year 1991 budget request. The fish bypass system will be considered. The early June visit to Portland by the Corps Headquarters staff along with Secretary Page's staff and OMB is part of that process.

Question. For which dams?

Answer. Sir, we will consider funding for Ice Harbor, Little Goose, Lower Granite, Lower Monumental, McNary, and The Dalles projects.

Question. Do you think OMB will be more forthcoming next time?

Answer. Sir, we don't know. We hope to improve the chances for favorable consideration by the early June visit. We should keep in mind that Secretary Page's recommendation to proceed with bypass facilities at four projects was based on the conclusion of the Army Review Team that a comprehensive study would determine that such facilities would be nationally justified mitigation measures. Upon further review within the Administration, it was concluded that the mitigation analysis which normally is prepared should be completed as a basis for an Administration position. The early June meeting will afford an opportunity to address this.

Question. When does the Corps intend to complete the fish bypass program?

Answer. Sir, if funds are made available and all testing elements yield anticipated results, we could complete facilities at the projects directed in fiscal year 1988 and fiscal year 1989 Acts in fiscal year 1995.

Question. Where are we today vis a vis the schedule?

Answer. Sir, overall we currently are on that schedule.

Question. Where are we behind schedule, and why?

Answer. The two new fish barges at Lower Granite Lock and Dam that were scheduled for completion by March and April 1989 are approximately 2 months behind due to an unusually severe winter season and contractor delays.

Question. Are we ahead of schedule anywhere?

Answer. Yes, sir; we are slightly ahead of schedule on the loading and holding facility at Little Goose. At Lower Granite we are on schedule with the bar screen deflector units.

Question. What is the status of the loading and holding facilities at Little Goose?

Answer. Sir, the loading and holding facilities at Little Goose have been awarded in two phases. The Bypass Facilities Phase I was let in December, 1988 and scheduled for completion in June, 1990. Bypass Facilities Phase II was let in April, 1989 and is scheduled for completion in September, 1990. Phase I is slightly ahead of schedule.

Question. How does the limited barging capability affect these facilities?

Answer. Sir, this year we are bypassing fish due to limited capacity in the barges, however, the loading and holding facilities and the two barges will be completed for the fiscal year 1990 fish season. We do not anticipate a limited capability then.

Question. What are the Corps' priorities among the various fish bypass projects?

Answer. Sir, we plan to follow the law Congress has set forth. Where we have a choice to do one project before another, we will do the one that provides the best return on investment.

LOWER SNAKE RIVER WILDLIFE COMPENSATION LANDS

Question. What has been accomplished on the Wildlife Compensation Program to date?

Answer. Sir, the project plan provides for acquisition of an aggregate of approximately 24,150 acres in fee or easement for fisherman access, wildlife habitat and hunting access. Of the 750 acres (50 acres in Idaho, 700 acres in Washington) for fisherman access, approximately 23 acres have been acquired in Idaho and 63 acres in Washington. The wildlife component of the plan (all acreage in Washington) will require approximately 8,400 acres of riparian and farm lands be obtained in fee or easement. Nearly 4,000 acres have been acquired. Approximately 15,000 acres of land contiguous to lower Snake project lands will be acquired for wildlife compensation and sportsman access. None of these 15,000 acres have been acquired.

Question. Why haven't the remaining lands under the Wildlife Compensation Program been funded?

Answer. Sir, although authorization has been enacted, the remaining lands for this component of the Lower Snake River Compensation Plan have been unable to compete successfully for funding with other national priorities and have not been funded since the renewed authorization (WRDA, 1986).

Question. How does the Corps of Engineers select a site and what is the normal procedure to acquire the lands?

Answer. Sir, properties are recommended for acquisition by the states of Idaho or Washington, depending upon where located, and then evaluated by the Corps for suitability in meeting the Lower Snake Fish and Wildlife Compensation Plan objectives. After environmental and cultural resource evaluations are conducted by the Corps, the state obtains the appraisal of the property which must be approved by the Corps. When approved, the Corps can then authorize the state to proceed with site acquisition.

Question. What is the estimated cost of the remaining wildlife compensation program for the Lower Snake Fish and Wildlife Compensation Plan?

Answer. Sir, the estimated remaining cost for the Wildlife Compensation Program is approximately $15,300,000. It comprises the following elements:

Wildlife lands (WA)	$13,700,000
Nonhatchery sports fishing (PH I, ID)—fisherman access	150,000
Nonhatchery sports fishing (PH II, WA)—fisherman access	662,000
Wildlife compensation facilities (improvements to wildlife lands, WA)	348,000
Engineering and design and supervision and administration	440,000
Total	15,300,000

Question. When the Wildlife Compensation Program is funded, how long will it take to complete the program?

Answer. Sir, the 1986 Water Resources Development Act (Public Law 99-662, section 856) authorized changes to facilitate the off-project lands program by allowing acquisition by fee and/or easement. In addition, the authorization specified that the acquisition period would extend only 5 years beyond initial program funding. Provided sufficient funding were available, all required acquisitions could be completed within the 5 year constraint.

SALMON RIVER FLOODING

Question. I appreciate your oral responses on the Salmon River frazil ice issue, and I would be grateful if you would provide, for the record, a detailed status report on that project and the Corps' future plans and funding for this project.

Answer. Sir, feasibility studies and a Detailed Project Report (DPR) and EIS were completed in 1985 by the Walla Walla District. The study was conducted under the Continuing Authorities Program, Section 205 of the Flood Control Act of 1958, as amended. Since that time, the Cold Regions Research and Engineering Laboratory (CRREL) has been conducting engineering tests on a low-cost ice control structure immediately upstream of the city of Salmon to induce ice jams. Field tests were conducted by CRREL during the winters of 1985-86, 1986-87, and 1987-88. In February 1989, an ice barrier was installed by CRREL in the Salmon River approximately 8½ miles above the city of Salmon. Field data were collected at that time. It has been determined by CRREL that additional field studies are required prior to recommending the type and best location for a permanent ice control structure.

The remaining ice studies by CRREL will be funded under the Section 205 Continuing Authorities Program. A plan of study is being prepared for a supplement to the existing DPR. This plan of study will include completion of CRREL's field studies and a final determination as to the location and configuration of the best permanent ice control structure. The supplement will evaluate the economic feasibility, and environmental and social aspects of CRREL's proposal. A coordination meeting with CARREL is planned in May to determine their remaining study needs including time and funding and to prepare an overall schedule of remaining efforts.

Question. How does the Corps plan to proceed on this program, and how much funding will you require to complete all the research and install frazil ice control equipment?

Answer. Sir, a supplement to the existing Detailed Project Report (DPR) will be prepared under Section 205 of the Continuing Authorities Program. The supplement will be prepared in two phases. The purpose of the first phase would be to identify preliminary costs, benefits, and environmental effects and local support. If the project appears to be economically feasible and acceptable to a local sponsor, more detailed studies would be conducted in the second phase of study. The results of the study and the recommendation will be closely coordinated with the local entities.

The following is a summary of preliminary fund requirements through completion of the supplement to the DPR. These requirements and schedule are currently under review. Costs for construction of the permanent ice control structure will be known at the completion of design.

New fund requirements to complete supplement to DPR [1]

Fiscal year 1990	$230,000
Fiscal year 1991	225,000

[1] Does not include funds for design and construction of the permanent ice control structure.

RECREATION FACILITY CLOSURES/O&M BUDGET CUTS

Question. I have been informed that under the Corps' new proposal for O&M budget savings, the Corps is seeking user fees for recreational areas, both for day use and for overnight camping. How would this system work, if Congress chose to enact it? What would the fee schedule be?

Answer. The legislative proposal includes authority for the Corps to charge fees for the use of specialized facilities, including swimming beaches and boat launching ramps, in day use areas, as well as for overnight camping in certain campgrounds where fees are not currently charged. Access to water resources development projects by the general public would in no way be affected by the legislative proposal. The Corps would administer the expanded fee system in a manner similar to the existing program. A fee schedule would be developed with fees comparable to those charged by other recreation providers in the area for similar facilities and services.

OPTIONS FOR REACHING RECREATION FACILITY O&M SAVINGS GOALS

Question. What other options has the Corps identified to meet its O&M savings goals?

Answer. The overall approach the Corps is pursuing involves: Deferral of maintenance; intensive management actions; consolidations to reduce management costs; and leasing areas to others.

MISSISSIPPI–LOUISIANA ESTUARINE AREA PROJECT

Senator COCHRAN. When Senator Johnston was here, he brought up the question of marshlands and loss of wetlands in the Louisiana coastal area. It brought to my mind a project that has been submitted and is pending approval, I think, since about May of 1986, entitled the Mississippi-Louisiana Estuarine Area Project.

This will provide a diversion of fresh water to the portion of the Gulf of Mexico where the marshlands are deteriorating and the oyster beds have almost disappeared. I think General Hatch referred to this project when he was responding to some of the questions posed by Senator Johnston.

What I would like to know is the current status of that project and an estimate of when you will approve it.

Mr. DOYLE. Senator, this project was just authorized in the 1988 Water Resources Development Act, which became law in November of last year.

General HATCH. Sir, the project is under design now. While there is concurrently ongoing the Washington level review that I described. I do not have a date for the completion of that review; I will provide that for the record. But we are actively designing the project, so no time is being lost at this point.

MULTIPROJECT SOLUTION TO ESTUARINE PROBLEM

Senator COCHRAN. I understand that there have been proposed two or three different individual projects as a part of an overall way of dealing with this problem. Is my understanding correct on that?

General KELLY. Yes, sir; it is.

Senator COCHRAN. What I would like to know is some time table, if you could give me that for the record, of when you expect this to move along and when these individual increments or elements of this overall project will be approved and be constructed.

I am very interested in that and I think the entire delegations of Mississippi, Louisiana, and maybe other states, congressional and Senate delegations, are going to be very anxious to see those projects move forward in the most expeditious way that they can. Now, this is an interesting Corps of Engineers project, in that the environmental interests who so often oppose what you want to do are very much involved in trying to move these forward. State governments are interested in it.

I know in our State, we have seen the appropriation of funds by the State legislature and the allocation of other resources to match these commitments of resources from the Federal level. So State and local government officials, the Corps of Engineers, environmental interests, and associations are all anxious for this project to move forward. It would be appropriate, I think, at this hearing for us to get a status report and a little more detail in responses so we can get a firm understanding of where we are and where we are going with this.

CORPS' COMMENDABLE HANDLING OF DROUGHT

I want to also take this opportunity to commend the Corps for the excellent effort last year in maintaining navigation on the Mississippi River. We had a drought last year that was very severe and we had some various situations develop for navigation in the Mississippi River, and I went over to Vicksburg and went with some of your Vicksburg district officials out in the river on a reconnaissance trip with them.

I was very impressed with the professionalism and innovation that they brought to the challenge. It was a difficult time for those who use the Mississippi River for shipping and navigation, and I think you did an excellent job under the circumstances to deal with those problems.

General **Kelly**. Thank you, sir.

MISSISSIPPI RIVER AND TRIBUTARIES PROJECT

Senator **Cochran**. There are two other projects that I wanted to bring up today. They are part of the Mississippi River and Tributaries project, and you all know better than I the background and history of this comprehensive effort to deal with flood control problems in the lower Mississippi River Valley.

I do not know of any State in the union that is more susceptible to damage and potential loss of life from flooding of the Mississippi and its tributaries than is my state of Mississippi.

A number of those projects that are included in the original authorization of the Mississippi River and Tributaries project have not yet been completed. Many have been postponed, others have been identified with higher priorities, and, for various reasons, some have had to wait their turn. Now we find some new controversies developing about whether or not some of these projects should be completed.

Senator Hatfield brought up the case the Supreme Court decided just recently, involving a project in his State. I know that litigation is underway that affects, for example, the Upper Yazoo project. There is also a question of whether litigation will affect the completion of the Yazoo Backwater Pumping Plant. Not only has that project been authorized but $4 million actually appropriated for its construction.

UPPER YAZOO AND YAZOO BACKWATER PUMPING PLANT PROJECTS

I would like to have from you, if you can give me any information at this time, a status report on these two projects, the Upper Yazoo project and the Yazoo Backwater Pumping Plant.

Mr. **Page**. Senator, you know, these have been almost a paramount endeavor with us. We are making a concerted effort on the Yazoo project, to define the local sponsor's needs and identify a coalition there that will come to agreement on how ultimately we will pursue and complete the project. We hope that we are getting to that point at this time. We need a consolidation of thought and agreement there.

NEED FOR LOCAL SPONSOR/PARTNER

Senator **Cochran**. It is my understanding that one factor which has played a role in the situation, is that there is no local sponsor for the Upper Yazoo project. And the district, itself, has been perceived by some as the advocate and the sponsor for the construction of that series of levees in that area of our State.

Mr. **Page**. That is true.

Senator **Cochran**. Is that correct?

Mr. **Page**. That is true. Senator, I think you will agree, and I am glad you brought that point out.

The Corps is acting alone on this. I do not believe it should. There should be a local sponsor or partner. We have asked the lower Mississippi Valley users to come together as a group for that purpose. We had planned to meet with some candidate members for that group in Washington, hopefully this month, so we could coordinate them to become a group sponsor, although this is not a cost-sharing project. I think that would greatly help this move along.

Senator **Cochran**. It might be very helpful, I think, to everybody who is interested and involved in this, if you could make available some time, personally, to spend with those who may want to discuss this issue with you.

And, if similarly, the Corps could make available the officials from the highest levels to try to figure out where you are on this, what the outlook is, what needs to be done, should this project be completed—what the situation is—so that there can be an understanding about the status, and what the intentions of the Corps are.

Mr. **Page**. That is very necessary. It is very important to arrive at the status, and to understand where we are going with that. I have personally discussed this with a number of persons at meetings in New Orleans and Washington, and I have written letters to various ones, asking that they come to the meetings. We intend to spend whatever time is necessary to clarify the situation.

YAZOO PUMPING PLANT PROJECT

Senator **Cochran**. I think that could be quite helpful. In that connection, I know that in the case of the Yazoo Backwater Pumping Plant project, the appropriations bill that was approved by Congress last year, provided $4 million for continued construction of that project, and "the language was approved by this subcommittee that directed the Secretary of the Army and the Chief of Engineers to obligate the funds appropriated for this critical element of the Mississippi River and tributaries project."

I understand that no funds have been obligated, and I am wondering whether or not you intend to comply with a directive of this Committee, and if not, why not?

NEED FOR COST-SHARING PARTNER

General **Kelly**. Sir, that particular project was broken out into what is known as a separable element, which requires a cost-sharing partner. Because there was no cost-sharing partner, no funds were allocated for that project.

Mr. DOYLE. But as soon as a cost-sharing partner comes forward, we are prepared to go forward.

Senator COCHRAN. That, in your judgment, is the only impediment to the obligation of the funds?

Mr. PAGE. Yes. Of all the discussions that we have had on the Yazoo, certainly the most heated ones, have been over the pumping facility, and how it came to be a separable element. The timing was such that it became a cost-sharing project.

Of course, as you know, most of the people in that area of Mississippi have said, "You know, we do not want to share the cost of this project. The cost should be 100 percent Federal." We have come back and said that, "We are bound by the fact that it is a cost-sharing project."

We feel that it has a benefit-cost ratio that could make the cut, and are looking for a cost-share partner. So far, we have not come up with one.

Mr. DOYLE. I think it is clear, Senator, that we recognize that there is a split view in the area on whether that project should go forward. But under the circumstances, with funds having been appropriated for the project, and our having to spend appropriations in accordance with the law, which also requires a cost-sharing partner, if a cost-sharing partner were to come forward before the end of the year, we would proceed with the project.

ARGUMENT THAT COST-SHARING IS NOT REQUIRED

Senator COCHRAN. Some have suggested, because they feel strongly that the project construction began before the date in the Act that would require cost sharing, that litigation might be pursued as one way to provide injunctive relief to require the Corps to fulfill its obligations under the law, in spite of the interpretation which you have given to us today.

Have you heard that, as a potential alternative for those who have a contrary view?

Mr. PAGE. Yes; we have heard the contrary view.

Senator COCHRAN. I do not pretend to know the answer to the controversy. I do remember a lot of the events which surrounded the inclusion of certain dates in the Acts, when the dates were included and during which conference, and others who were involved, and there are other committees that have interests in this issue, too. It is interesting what a high profile this one project has attained in recent years.

Mr. PAGE. There is a lot of emotion associated with it.

Senator COCHRAN. Quite a bit. You ought to live there for awhile. The sensitivity of those emotions would be interesting for you to experience.

The fact is that this entire Mississippi River and Tributaries project, including many of these elements, which we have talked about today, is very important for various reasons, to a large number of the people who live in my state. That is why I bring these issues up today, and ask you the questions that I have.

We need to know what your position is. And I think it is better for everybody concerned, if we know what your thinking is currently about it, and what your intentions are, what the alternatives are for those who are on both sides of the issue, because it is very controversial.

I thank you for discussing these items with me. And I appreciate your willingness to provide information that we have requested for the record.

Mr. PAGE. Thank you, Senator.

Senator COCHRAN. Thank you very much. Thank you, Mr. Chairman.

Senator BURDICK. Welcome to the committee, Mr. Secretary.

Mr. PAGE. Thank you, sir.

Senator BURDICK. I was just wondering here out loud, how long we will be having the benefit of your wisdom on this subject matter.

Mr. PAGE. These are great mysteries which surround putting people in place, or retaining them, in the Government. I wish I knew the formula. But it has been a pleasure, and I have enjoyed it very much. And I have certainly enjoyed working with your committee, as with this one.

Senator BURDICK. I can say the same thing. You can understand, with all the newspaper articles, I wonder where your future lies. We will wait and see.

Mr. PAGE. Thank you, sir.

AREAS OF MAJOR CONCERN

Senator BURDICK. I have a detailed statement for the record, which I would like to summarize, before questioning the Secretary. I ask that the full statement be made part of the record.

[The information follows:]

STATEMENT OF QUENTIN N. BURDICK

Mr. Burdick: Thank you Mr. Chairman. Secretary Page, as a member of this Committee and as Chairman of the Environment and Public Works Committee, I view the FY 1990 Corps civil works budget with concern. I am also disturbed by other activities which appear to be taking place within the Corps of Engineers and the executive branch with regard to water resources policy. I intend to address my concerns in this statement, and I will have some questions.

In November of 1986 -- barely two and a half years ago -- the Congress and the President agreed on the terms of a peace treaty which ended almost 20 years of political warfare on water policy. That peace treaty was the 1986 Water Resources Development Act, which contained far-reaching reforms in the financing of Corps of Engineers projects.

Mr. Secretary, I must candidly tell you that in my judgement the spirit of that peace treaty has been trampled in the past four months. With regard to the FY 1990 budget, the Administration proposes to abandon operation and maintenance of 450 harbors and 650 recreation areas, and support for new construction starts can only be described as less than enthusiastic.

Mr. Chairman, in my view, maintenance of harbors serving commercial traffic cannot be curtailed at targeted ports without amending Title II of the 1986 Water Resources Act. In response to a request from the Committee on Environment and Public Works, the Law Division of the Congressional Research Service examined this budget proposal. The CRS agrees with me, and I would like to place a copy of their response in the record, if I may.

Mr. Secretary, I find it difficult to believe that the executive branch is unaware of the legislative history surrounding port maintenance policy and user fees. From 1980 until 1986 the Congress and David Stockman fought continuously over whether the proceeds from port maintenance user fees should be used where the fees were collected on a port specific basis or distributed national on a uniform basis. The 1986 Act settled this dispute in favor of national application. My friend from Oregon who sits on this Committee can, I am sure, provide you and the current director of OMB with a detailed history of this issue.

The FY 1990 budget for the Corps also included a hit list of more than 650 recreation areas at Corps reservoirs to be either closed or cut back.

Mr. Secretary I have received petitions from more than 500 citizens in my State concerning one of these recreation areas at the Little Missouri Bay, on Lake Sakakawea, known in the state as Slatter's Resort. The savings attributable to this cut at Slatter's Resort and seven other sites around Lake Sakakawea are $453 thousand dollars. At the same time the budget for Lake Sakakawea operation and maintenance includes $855 thousand for the following:

-$287 thousand dollars for road repairs;
-$44 thousand dollars for an analysis of ice effects on the lake, which anyone in the state can tell you about;
-$138 thousand dollars to repaint a surge tank;
$52 thousand dollars for land acquisition;
$101 thousand dollars for data collection;
$192 thousand dollars to rehabilitate the heating system in an administration building; and
$41 thousand dollars to buy trucks.

If you need to cut $453 thousand from Lake Sakakawea's operation and maintenance budget, Mr. Secretary, take it from some of the above categories, and keep those recreation areas open.

I recognize that for nine years the Administration has sent to the Congress legislation to remove the existing prohibition on user fees at Corps recreation areas. I wish to go on record as not being categorically opposed to this approach, which would generate good revenues at many projects. But this is not the way to begin the debate. Until I have a clear understanding of the Bush Administration's recreation policy, the issue will not be considered in the Committee on Environment and Public Works.

Then there is the question of new starts. It appears very clear to me that while Ronald Reagan supported water resource development new starts, George Bush does not.

Ronald Reagan proposed 11 new starts for the Corps of Engineers in his FY 1990 budget. The Reagan budget stated loudly and clearly that the Executive Branch was supporting the cost sharing reforms of the 1986 water act in the most meaningful way by initiating the construction of needed water projects having the support of non-federal public entities.

What does the current administration say? Along with everything else, new starts are negotiable and part of the "flexible freeze". I would note that in a recent poll of business executives published in Business Industry weekly 64 percent of the business executives polled on their support for the President's budget responded that they didn't understand the President's proposal. Is it any wonder then that inquiries from members of Congress on the status of Corps "new starts" have elicited an ambiguous response, an answer stating that new starts are part of the budget "for the time being".

This cannot be viewed as anything less than backing away from support for the 1986 Act reforms, because reforms are meaningless if they are never used.

And I must say, Mr.Secretary, that I find your support for these new starts to be tepid at best. I have seen any number of letters from you on the subject of the CPAR program, but only one letter on the subject of new starts. I have only one vote on this committee, Mr. Secretary, but let me assure you that I will oppose any new initiatives in the Corps budget unless new starts are funded.

Moving on to other concerns, I continue to hear rumors that you have under review proposals for cost sharing which go beyond the 1986 Act. Let me say before you answer any questions on this subject that as far as I am concerned the Congress and the Executive Branch made a deal in 1986 on water project financing. A deal is a deal. I intend to adhere scrupulously to the strictures of the 1986 Act and I expect the executive branch to do the same. In my judgement this means that financing partnerships which were not addressed, not discussed, not negotiated, in short not mentioned and not part of the 1986 Water Act are policies which go beyond the strictures of that act every bit as much as is any proposal to reduce or retreat from the financing arrangements which were agreed upon.

Finally, portions of the newly issued Corps policy manual raise questions about the intent of the Administration to go beyond the expressed intent of Congress in the 1986 Act in a number of other areas. I will have a number of questions relating to this issue.

My questions:

Mr. Secretary, forgive the bluntness of this first question. You were nominated to your current position by the previous administration and since no one has been nominated to fill your post I must ask you what your status is with the Administration? Can we expect that you will be formally retained in your position?

Mr. Secretary, does the Bush Administration intend to use the 1986 Water Resource Development Act as the measure of its water policy?

Are you and OMB seriously considering proposing new cost sharing policies beyond the 1986 Act?

Do you believe that there is anything more important to the future of the Corps civil works program than a stable funding of new starts on a regular basis?

Then Mr. Secretary, what have you done to secure funding for new starts in the 1990 budget? Have you personally discussed this subject with the President? With the White House staff? With OMB Director Darman?

If you were directed by Congress to start projects within available funds would you do so?

What are you going to do in the coming weeks to get new starts budgeted and funded? Is there any administration representative prepared to discuss this subject over the next few weeks? What actions are you going to take to help this committee fund these projects?

In response to written questions which I posed to you on January 25, 1989 regarding the two budget hit lists, I received a partial written response on April 14, 1989, which was signed by a member of your staff. I do not know why it took nearly three months to obtain a reply. The information I requested should have gone into the original budget documents in the first place. Would you care to comment on this?

One of these questions concerned who made these budget cuts and on what programmatic basis. The answer included the fact that the Corps budget request to OMB did not include these cuts. The answer does not say who did propose the cut. I presume this is OMB's notion of a cute reply on the subject. Did OMB make these cuts?

(presume yes) Did you appeal these cuts in the executive budget process?

If no, why not, if yes, what rationale was given for the reduction at that time?

Your written answer to the question of why these cuts were made reads as follows "The January 9 budget request reflects extensions of the beneficiary-pay principle by calling for assumption of responsibility for lower priority recreation facilities and low volume harbors currently being maintained by the Corps."

Mr. Secretary, what the devil does this mean? Isn't this just a way of saying the non-feds have to pay for this because we don't think its worth the money?

Mr. Secretary, I would like you to tell me what the beneficiary-pay principle is, to what the administration intends it to apply, and its limits in the context of the Corps program in particular and public works in general.

(If he begs off, press him as follows) I'd like you to informally comment if you would. What does this concept mean? How does your office know when not to apply it?

How does it apply to the removal of federal maintenance funds without any prior notification, negotiation, or warning to recreation areas funded for decades or harbors funded for a century?

Mr. Secretary, there are three standards by which a water project are judged: national economic development; environmental integrity; and engineering competence. Would you agree that these are the standards by which Congress and the Administration should evaluate proposed water projects?

Then can you tell me how and why you have issued a new policy proposal which -- independent of any Congressional direction or guidance-- adds a new standard relating to the character of the entities in the project area to the list? I am referring to paragraph 12-7 of the Corps policy manual.

(Whatever his reply indicate the need for further discussion of this issue because members from both sides of the aisle have expressed serious concerns over it.)

Mr. Secretary, have you approved requirements for cost sharing on Corps of Engineers services which are not explicitly enunciated in the 1986 Water Act? If so, on what authority are you proceeding and would you provide me with a comprehensive list of these policies. If not, are such impositions being contemplated in your office and for what reason?

MEMORANDUM FROM THOMAS J. NICOLA, LEGISLATIVE ATTORNEY, CONGRESSIONAL RESEARCH SERVICE

February 10, 1989

TO	:	Senate Committee on Environment and Public Works Attention: Thomas Skirbunt
FROM	:	American Law Division
SUBJECT	:	Whether a Statutory Change Would Be Needed to Implement a Budgetary Proposal Relating to the Harbor Maintenance Trust Fund

This memorandum responds to your inquiry regarding whether a statutory change would be needed to implement a proposal contained in the President's Fiscal Year 1990 Budget. In the Budget, the President requested funds for the Army Corps of Engineers, Operation and Maintenance, General Account. The request stated, in relevant part:

> ...This request reduces funding for operation and maintenance of recreation facilities, and does not include funding for dredging recreation harbors or commercial harbors receiving less than 25,000 tons of commercial navigation traffic per year. Options for future operation and maintenance of affected harbors on a reimbursible basis, including those that may require legislation, are under review. Office of Management and Budget, *Budget of the United States Government Appendix, Fiscal Year 1990*, I-H4 (1989).

The President proposed that no funds should be appropriated for dredging recreation harbors and commercial harbors that receive less than 25,000 tons of commercial navigation traffic per year.

A question about whether a statutory change would be needed to implement the portion of this proposal that relates to commercial harbors has been raised because of present language in the statute that authorizes appropriations for operations and maintenance. Section 210(a) of the Water Resources Development Act of 1986, P.L. 99-662, 100 Stat. 4082, 4106, 33 U.S.C. § 2238 (1986), authorizes funding for operations and maintenance out of the Harbor Maintenance Trust Fund. Section 210(a) states, in relevant part:

> TRUST FUND.--There are authorized to be appropriated out of the Harbor Maintenance Trust Fund, established by section 9505 of the Internal Revenue Act of 1954, for each fiscal year such sums as may be necessary to pay--

> (2) not more than 40 percent of the eligible operations and maintenance costs assigned to commercial navigation of all harbors and inland harbors within the United States.

Because section 210(a) authorizes appropriations for relevant costs assigned to commercial navigation of *all* harbors and inland harbors within the United States, it appears that a statutory change would be needed to implement the President's proposal not to fund dredging of commercial harbors that receive less than 25,000 tons of commercial navigation traffic per year.

Some passages from the text of the act and the legislative history as well as some principles of appropriations law appear to support this view. The Water Resources Development Act defines some of the terms used in section 210(a)(2). The term "eligible operations and maintenance," means "all operations, maintenance, repair, and rehabilitation, including maintenance dredging reasonably necessary to maintain the width and nominal depth of any harbor or inland harbor." Section 214(2), 23 U.S.C. § 2241(4).

The Act also defines "harbor" and "inland harbor" in terms of what those words mean and do not mean. "Harbor," means "any channel or harbor, or element thereof, in the United States, capable of being utilized in the transportation of commercial cargo in domestic or foreign waterborne commerce by commercial vessels." Section 214(4), 33 U.S.C. sec. 2241(4). "Inland harbor" means "a navigation project which is used principally for the accommodation of commercial vessels and the shipment of waterborne cargoes on inland waters." Section 214(5), 33 U.S.C. § 2241(5).

"Harbor" does not include such things as an inland harbor, the Saint Lawrence Seaway, and local access or berthing channels; "inland harbor" does not include such things as projects on the Great Lakes, projects that are subject to tidal influence, and local access and berthing channels. Section 214(4) and 214(5), 33 U.S.C. § 2241(4) and 2241(5). Significantly for the purpose of this inquiry, neither paragraph (4) nor (5) contains any exclusion that relates to tonnage of commercial traffic. Moreover, the meanings of "harbor" and "inland harbor" do not mention tonnage either; they are presented in terms of capability of being utilized to transport commercial cargo, in the case of "harbor," and principal use to accommodate commercial vessels and to ship waterborne cargoes, in the case of "inland harbor."

The legislative history of the Act elaborates on the scope of harbors and inland harbors that qualify for funding. The joint explanatory statement in the conference report. describing section 210(a) of P.L. 99-662, states that the conference substitute "includes the Senate provision concerning authorizations from the Harbor Maintenance Trust Fund for eligible operations and maintenance costs." H.R. Rep. No. 99-1013, 99th Cong., 2d Sess. 210 (1986).

The Senate report explains that the section that would be enacted as section 210(a) of P.L. 99-662, section 607 of S. 1567, 99th Cong., 1st Sess., "...authorizes the appropriation of funds from the Harbor Maintenance Trust Fund, to pay...up to 40 percent of the annual operation and maintenance costs assigned to commercial navigation of all channels and harbors of the United States...." S. Rep. No. 99-126, 99th Cong., 1st Sess. 56 (1985).

The report indicates that the Committee on Environment and Public Works considered whether to limit availability of appropriations for operations and maintenance, including dredging, on the basis of factors other than the one that appeared in section 607 of S. 1567.

> In recent years, the Committee considered a variety of proposals involving harbor maintenance. These ranged from diverting a portion of customs revenues for harbor work to port-by-port maintenance fees to more studies. The debate in some cases is between high maintenance harbors and low maintenance harbors; in others it is between large ports and small ports.
>
> Part B of title 8 [enacted as title XIV of P.L. 99-662] imposes a harbor maintenance tax, one that will be uniform across the nation. This tax is set at 4 cents per $100 value of the cargo passing through harbors. This will raise an estimated $140,000,000 yearly. The fees will be collected on all cargoes loaded and unloaded at America's commercial harbors, including those in the Great Lakes.
>
> Part B places the revenues into a Harbor Maintenance Trust Fund, which will be used to finance up to 40 percent of the costs of future harbor maintenance dredging.
>
> The bill sets this cargo tax on the value of the commercial cargo loaded or unloaded. The tax in title 8 is not on the harbor, nor is it on the vessel's operator or owner. The tax is set on the value of the cargo, and is to be paid by the owner of the cargo, or his agent. ...
>
> All cargoes are subject to this ad valorem tax, except unprocessed fish and aquatic animals fresh caught during the course of the voyage.
>
> Title 8, which includes the inland waterway fuel tax as well as the harbor taxes, will be considered by the Finance Committee. That committee may well alter title 8 insofar as the structure of the actual tax and fees. But the use of the money collected pursuant to this section will remain as described by the Committee on Environment and Public Works elsewhere in this bill. *Id.*, at 9, 10.

This passage indicates that the Committee rejected proposals to impose the tax on factors such as amount of maintenance or size of ports. The Committee chose instead to impose a uniform harbor maintenance tax on all cargo. Because the Committee decided to impose the tax on all cargo, it apparently concluded in fairness that the proceeds should be available to maintain all commercial ports.

The report also describes section 812 of S. 1567, which was enacted as section 1403 of P.L. 99-662.

> This section establishes a Harbor Maintenance Trust Fund in the Treasury of the United States. ...
>
> Monies in the trust fund are to be used only for the purposes authorized under section 607 of this act. Section 607 provides that monies in the trust fund can only be used to pay...up to 40 percent of the operation and maintenance costs of the commercial channels and harbors of the United States. *Id.*, at 114.

At the outset, we stated that some provisions of the text and legislative history of the Water Resources Act and some principles of appropriations law support the view that a statutory change would be needed. The Comptroller General, the officer who determines the legal availability of appropriations, has enunciated the following principles of appropriations law that reveal the legal effect of authorizing laws on expending appropriations:

> As a general proposition, appropriations made to carry out authorizing laws "are made on the basis that the authorization acts in effect constitute an adjudication or legislative determination of the subject matter." B-15117, June 27, 1963. Thus, appropriations to carry out enabling or authorizing laws must be expended in strict accord with the original authorization both as to the amount of funds to be expended and the nature of the work authorized. 36 *Comp. Gen.* 240, 242 (1956); B-125404, B-151157, *supra*. Office of the General Counsel, General Accounting Office. *Principles of Federal Appropriations Law*, 2-38 (1st ed. 1982).

Conclusion

This memorandum has addressed whether a statutory change would be needed to implement a budgetary proposal to eliminate appropriations for commercial harbors that receive less than 25,000 tons of cargo per year. Section 210(a) of the Water Resources Development Act of 1986 authorizes appropriations of such sums as may be necessary to pay up to 40% of eligible operations and maintenance costs assigned to commercial navigation of all harbors and inland harbors within the United States. The Comptroller General has held that appropriations must be expended in strict accord with authorizations. Because section 210 makes all commercial harbors and inland harbors eligible for these payments, it appears that the budgetary proposal could not be implemented unless Congress were to amend section 210 to disqualify these low volume harbors. In the absence of a statutory amendment either in an authorization or appropriation act yet to be enacted, it appears that these low tonnage commercial harbors would continue to remain eligible to receive payments appropriated from the Harbor Maintenance Trust Fund.

Senator **Burdick**. This statement, Mr. Secretary, says three things. First, your fiscal year 1990 budget for the Corps is disappointing. The recreation and harbor hit list constitutes a giant step backward, in my opinion, from the agreements reached in the 1986 Water Act.

Second, I believe the support given for the new starts by the Bush administration is somewhat disappointing. No one in the administration has exerted sufficient energy to insure the funding for these projects. If we do not construct projects, under the 1986 act reforms, we render those reforms meaningless.

Third, I am greatly concerned by reports which come to my office about proposals within the executive branch to expand financing partnership arrangements to activities beyond those identified in the 1986 Water Act.

Mr. Secretary, these are all issues which focus attention on your office. A budget which I find deficient, comes from your office. Proposals for new starts are not being forcibly pursued. Policies, such as the executive use rule, which obstruct the capacity of the Corps of Engineers to serve the water resources needs for the country, all may be issued over your signature.

I urge you to use your considerable talents and dedication to implement the hard-won policies agreed to in the 1986 period, before moving on to other issues. Otherwise, all of that effort will have been for nothing.

While I have questions today, I want to make clear that I expect to discuss these issues further—perhaps in the Committee on Environment and Public Works.

OUTLOOK FOR NEW CONSTRUCTION STARTS

The questions that I have today will be submitted to you; however, I have several that I will ask you now.

What are you going to do in the coming weeks to get new starts budgeted and funded? Is there any administration representative prepared to discuss this subject over the next few weeks? What actions are you going to take to help the committee fund these projects? What about the future of new starts, in other words?

Mr. **Page**. Senator, first of all, I recognize the three serious concerns that you have, and would be happy to address those with you at any time.

As a matter of record, as I have pointed out to you in your office, in your Committee, we think that our new starts proposal was solid, and a good one. We strongly support the projects proposed.

In our continuing dialogue with OMB, I do not sense that there is a lack of desire to see them go forward. I know that one of your concerns is that the enthusiasm which the administration has shown for the new starts has been diappointing. But I have not found that, in my dealings with OMB to be so. I will tell you that we will continue to work with OMB to assure that these new starts become a reality. I personally believe that they are totally justified; that for us to continue to defer new capital expansion required to meet needs for navigation and flood control, is really to mortgage our future; and that, unless we proceed with them, we could find ourselves with an infrastructure problem not dissimilar to that of our roads, bridges, tunnels, and communication system.

Senator BURDICK. Do you have any information, or direction from OMB, or from the President's office, or the President, himself, with regard to the policy of new starts?

Mr. PAGE. No; I can only say that our first budget was a Reagan budget. This budget was reviewed by OMB, and as I understand it, under the Bush administration, and we had no change. Some here may have followed it closer on a daily basis than I have, but we have picked up no negative vibes.

Now, I understand that you do look to us for more enthusiastic action, probably with OMB, and we will do that. We will continue to pursue these new starts.

Senator BURDICK. It is still unclear. Does the Administration support new starts, or does it not?

Mr. PAGE. I can only say yes, it is for the new starts. If it were not for them, I believe it would have cut them from the Bush budget. That is the only answer I can give you.

I discussed new construction starts with Bob Grady, who has taken Bob Dawson's place, when he first came in and I saw nothing in that conversation that even indicated that there would be a reduction or a cut in them.

Senator BURDICK. In other words we can look forward to getting some support from the administration if we keep putting new starts in this bill?

Mr. PAGE. You said you would?

Senator BURDICK. I say, we can expect support from the administration if we put new starts in this bill?

Mr. DOYLE. Obviously, Senator, that is a difficult question to answer in isolation with what else is in the bill. It is clear on the record that the Reagan administration proposed new starts for the second year in a row. The Bush administration has not changed that and the budget you have before you—that is, President Bush's submission to you—includes 11 new starts and I think what Secretary Page has said clearly is that he has seen no indication that that position has changed.

Mr. PAGE. I know of no additional new starts that would come from the administration, if that is what the Senator was asking. We are not aware of any.

Senator BURDICK. Have you had any communication with OMB that it will support the new starts?

Mr. PAGE. As I have stated before, I personally have heard nothing that indicates that OMB is not supportive. We have the people here with us that deal with OMB daily. Steve Dola, the Senator was talking about the letter we wrote.

Mr. DOLA. We did write a letter in response to your request that we ran by OMB and that letter indicated that we did support the new starts and that continues to be our position. There has been no indication that new starts are to be withdrawn.

Senator BURDICK. Is that from OMB?

Mr. DOLA. The letter we sent to you—I believe it was on March 2—was coordinated with OMB and certainly it indicated that our support continued. Mr. Chairman, for completeness, as the Secretary said at the beginning, our budget is part of the discretionary budget that is subject to negotiation and only Congress and Mr. Darman and others can finally determine the outcome, but our budget has those new starts. We support them strongly, and we hope Congress will let them stay in through these negotiations.

Senator **Burdick**. When we move this bill to the floor we will do it with the understanding that the President will support us on the new starts.

Mr. **Page**. Yes.

ADDITIONAL PREPARED QUESTIONS SUBMITTED FOR THE RECORD

Thank you. Senator Johnston and other members have submitted additional questions. Without objection those will be made part of the record at this point.

Senator **Burdick**. That completes the hearing. We will recess until 2 tomorrow afternoon.

Mr. **Page**. Senator, we feel an obligation as we deal with you and Tom through this exercise on new starts to keep you advised. If we see any indication of nonsupport of new starts, we will let you know, but I do not know of any.

Senator **Burdick**. Thank you.

[The following questions were not asked at the hearing but were submitted to the Corps for response for the record:]

Questions Submitted by Senator Johnston

RATIONALE FOR BUDGETING FOR NEW CONSTRUCTION

Question. What is the rationale for placing scarce available dollars on new construction instead of on the operation and maintenance of existing projects where a Federal investment has already been made?

Answer. This is a difficult decision, but we believe it represents the best use of Federal funds. We feel obliged to proceed as expeditiously as possible, within budget constraints, with sound flood control and commercial navigation new construction projects for which local sponsors have made, or will be required to make, significant financial commitments. The reduction in the Operation and Maintenance, General, account, as have stated, involves deferral of maintenance, cessation of dredging of some harbors, and closure of some recreation sites that no longer should be maintained by the Corps.

NEW CONSTRUCTION STARTS RECOMMENDED TO OMB

Question. How many new starts did the Corps request of OMB?

Answer. We recommended 29 new construction starts.

Question. Could the funding requirement for these projects be accommodated within the out-year budget planning targets established by OMB?

Answer. No, it could not. Simultaneously we requested an increase in the OMB planning ceiling for the Corps. However, the large deficit and the President's overall budgetary priorities precluded accommodation of such an increase.

TOTAL POSSIBLE FISCAL YEAR 1990 NEW CONSTRUCTION STARTS

Question. How many projects are there that the Corps could conceivably initiate construction on in 1990 if funding were provided? What is the total Federal cost to construct those projects and the fiscal year 1990 funding requirements?

Answer. In all some 39 projects have been identified as potential fiscal year 1990 new construction start candidates. This is an updated figure reflecting slippage that has occurred in the PED stage since last summer's nominations by the field. Total Federal cost to construct the 39 projects amounts to over $2.8 billion (October 1988 price level) of which over $2.7 billion would be funded under the Construction, General account for 36 projects and some $120 million funded under the Flood Control, Mississippi River and Tributaries account for three projects. The fiscal year 1990 funding requirement would approximate $186 million of which $182.6 million would

be funded under the Construction, General account and $3.7 million required for the Flood Control, Mississippi River and Tributaries account.

FUNDING PROFILE FOR CONSTRUCTION GENERAL ACCOUNT

Question. Could you provide for the record a funding profile for the Construction, General account which shows OMB planning projections and construction obligation ceiling through completion of those projects which you could conceivably start in fiscal year 1990, the 29 requested by the Corps and the 11 budgeted new starts?

Answer. We will furnish a table for the record showing that information

[The information follows:]

CONSTRUCTION, GENERAL ACCOUNT FUNDING PROFILE

[In thousands of dollars]

Program category	Fiscal years—					Balance
	1990	1991	1992	1993	1994	
OMB program ceiling (gross) [1]	1,295,000	1,241,000	1,163,000	1,005,000	996,000	NA
Ongoing programs [2]	1,211,000	1,053,000	841,000	565,000	406,000	NA
New start allowance [3]	84,000	188,000	322,000	440,000	590,000	NA
Budgeted fiscal year 1990 new starts [4]	84,000	163,000	221,000	197,000	149,000	657,000
Requested fiscal year 1990 new starts [5]	150,000	247,000	279,000	229,000	169,000	706,000
Eligible fiscal year 1990 new starts [6]	183,000	292,000	310,000	257,000	170,000	706,000

[1] Excludes allowance for savings and slippage and $2 million annually for alteration of bridge program.

[2] Includes funds for continuing authorities, aquatic plant control, and other nonproject-specific programs.

[3] Includes funds for new starts in fiscal year 1990 and each of the four follow-on outyears, fiscal year 1991-fiscal year 1994.

[4] Includes 10 of the 11 budgeted new starts. The other is a Mississippi River and Tributaries [MR&T] project.

[5] Includes 23 of the 27 recommended CG projects; four can no longer be implemented in fiscal year 1990 due to slippage. The other two are MR&T projects.

[6] Includes 36 of the 39 eligible projects. The other three are MR&T projects.

DESCRIPTION OF NEW CONSTRUCTION START CANDIDATES

Question. Provide a brief summary description of each potential new start not included in the budget for the record, including the purpose, costs, benefit-cost ratio, and any other pertinent data, etc.

Answer. We will provide that information for the record.

[The information follows:]

FY 1990 POTENTIAL NEW CONSTRUCTION STARTS
DATA SUMMARY OF UNBUDGETED CANDIDATES

S-211c
(90NSNGH4)
MAY-23-89

AUTH 1/ DATE	DIV	PROJECT	STATE	MAJOR 3/ OUTPUT	BCR TOTAL @ 8 5/8%	BCR TOTAL @ 10%	PROJECT FIRST COST ($000) 2/ TOTAL	FEDERAL	NON-FED	DESCRIPTION
OTHER RECOMMENDED NEW STARTS										
86	NAD	Atlantic Coast Assateague Isl	MD & VA	SDP	1.19	1.02	59,800	38,500	21,300	Beach nourishment. Maryland is constructing the recreation element at its own expense.
60	SAD	Hudson River	FL	SD	2.10	1.80	2,805	2,284	521	Channel improvements. Reevaluation underway.
86	SAD	Sarasota County	FL	SDP	1.80	1.60	33,300	19,200	14,100	Beach nourishment.
70	SAD	Lee County, Captiva Island	FL	SDP	3.10	2.90	24,800	11,300	13,500	Sponsor reimbursement (Sec. 215).
86-C	NCD	Muscatine Island	IA	UF	5.70	4.80	7,000	5,270	1,730	Levees and floodwalls to raise height of existing system.
86	NCD	Little Calumet River	IN	UF	1.50	1.30	80,400	60,000	20,400	Levees, floodwalls, channel improvements, water control and diversion structure, recreation facilities, and wildlife mitigation and enhancement measures.
86	LMV	Westwego – Harvey Canal Hurr. Prot.	LA	HDP	2.60	2.40	82,700	53,800	28,900	Levees with floodwalls as land constraints dictate.
86	LMV	Cape Girardeau – Jackson	MO	UF	1.80	1.43	34,030	25,173	8,857	Channel improvement, dry detention reservoir, and recreation facilities.
86	MRT	Horn Lake Creek & Tribs.	TN & MS	UF	1.50	1.30	4,400	2,830	1,570	Channel improvement, clearing and snagging, and recreation facilities.
86	SWD	Mid Rio Grande–Bernalillo to Belen	NM	UF	1.40	1.17	58,000	40,400	17,600	Raising height of levees, purchase of 200 acres for F&WL mitigation, and creation of 75 acres of wetland
86	NPD	Bethel Bank Stabilization	AK	SDP	1.30	1.18	12,300	11,100	1,200	Bank stabilization with rock riprap.
86	NPD	Grays Harbor	WA	DH	1.80	1.40	69,300	43,600	25,700	Deepening and widening existing channels and providing crab and fish mitigation measures.
86-C	SPD	Guadalupe River	CA	UF	1.40	1.20	43,600	21,800	21,800	Channel improvement, with F&WL mitigation and riparian plantings.
68	POD	Maalaea Harbor	HI	SD	3.70	1.90	8,680	5,960	2,720	Improving channels, breakwaters, and turning basin.

1/ Some projects may require reauthorization pursuant to Section 902 of P.L. 99 - 662.

2/ Cost estimates as of January 9, 1989. May not reflect latest data.

3/ Legend:
DH = Commercial Navigation - Deep Draft
GR = General Recreation
HDP = Hurricane Damage Prevention
RF = Rural Flood Damage Prevention
SD = Commercial Navigation - Shallow Draft
SDP = Storm Damage Prevention
UF = Urban Flood Damage Prevention

FY 1990 POTENTIAL NEW CONSTRUCTION STARTS
DATA SUMMARY OF UNBUDGETED CANDIDATES

S-211c
(90NSRGH4)
MAY-23-89

AUTH 1/ DATE	DIV	PROJECT	STATE	MAJOR 3/ OUTPUT	BCR TOTAL @ 8 5/8%	BCR TOTAL @ 10%	PROJECT FIRST COST ($000) 2/			DESCRIPTION
							TOTAL	FEDERAL	NON-FED	
OTHER ELIGIBLE NEW STARTS										
60,83	NAD	Shinnecock Inlet	NY	SD	1.50	1.00	14,300	11,100	3,200	Channel improvement, rehabilitation of existing jetties, and construction of one new jetty.
86	SAD	Ft. Pierce Harbor	FL	DH	1.90	1.90	6,686	4,250	2,436	Deepening and widening existing channels and turning basin.
86	SAD	St. Johns County	FL	GR/SDP	1.20	1.20	3,826	2,334	1,492	Beach nourishment. Would add recreation area.
86	SAD	Tampa Harbor, Port Sutton	FL	DH	3.80	3.20	2,670	1,156	1,516	Channel deepening and widening. Reevaluation underway
86	SAD	Manatee County	FL	SDP	1.80	1.80	5,582	2,980	2,602	Beach nourishment.
85	SAD	Gulfport Harbor	MS	DH	1.04	1.01	53,050	34,500	18,550	Deepening and widening existing channel and constructing a littoral drift impoundment basin.
86	SAD	Roanoke River – Headwaters Area	VA	UF	1.20	1.05	33,400	18,200	15,200	Channel improvement and floodwalls, flood warning system, and recreation facilities.
86	NCD	Loves Park	IL	UF	1.40	1.19	24,630	17,600	7,030	Channel improvements, 3 detention reservoirs, and a 167.7 cfs pump station.
86	NCD	O'Hare Reservoir	IL	UF	1.09	0.89	20,300	15,200	5,100	1,050 ac–ft excavated reservoir for temporary storage of sanitary and storm runoff.
46,86	NCD	Marshall	MN	UF	1.40	1.20	7,640	5,580	2,060	Levee and channel improvements, diversion channel and interbasin overflow structure, and recreation facilities. To eliminate problems of existing project.
81,86	LMV	Meramec R. Basin–Valley Park Levee	MO	UF	1.20	1.11	15,100	10,463	4,637	Levee system, recreation facilities, a 10 cfs pump station, and 2 ponding areas for interior drainage.
86	MRT	St. John's Bayou–New Madrid Fldway	MO	RF/UF	1.16	0.98	96,300	59,800	36,500	Channel improvements, a 1,500 cfs pump station, acquisition and development of 2,500 acres for F&WL mitigation, plus provision for flooding 4,900 acres annually during waterfowl migration season.
86	NPD	Kake Harbor	AK	SDP	0.53	0.45	14,100	12,690	1,410	Breakwaters for berthing area for 150 fishing boats.
86	NPD	Zintel Canyon	WA	UF	1.20	1.12	7,000	5,270	1,750	1,660 ac–ft reservoir with channel enlargement.

1/ Some projects may require reauthorization pursuant to Section 902 of P.L. 99 - 662.

2/ Cost estimates as of January 9, 1989. May not reflect latest data.

3/ Legend:
DH = Commercial Navigation – Deep Draft
GR = General Recreation
HDP = Hurricane Damage Prevention
RF = Rural Flood Damage Prevention
SD = Commercial Navigation – Shallow Draft
SDP = Storm Damage Prevention
UF = Urban Flood Damage Prevention

APPROVED GDM'S FOR NEW CONSTRUCTION STARTS

Question. Do all the projects proposed as new starts by the Corps for fiscal ye 1990 have approved GDM's? If not, why?

Answer. Yes, sir; the 11 proposed new construction starts in the President's budget have approved GDM's.

SELECTION CRITERIA FOR NEW CONSTRUCTION STARTS

Question. What criteria were used to evaluate and select projects for inclusion in your new construction starts proposal made to OMB for fiscal year 1990?

Answer. Well, we use a number of criteria. I will describe a few of the more important ones. First, the project must have a positive benefit-cost ratio at a 10 percent interest rate. Second, it must have a sponsor to pay the nonfederal share of project cost. Third, it must be ready to start construction during the fiscal year for which we request appropriations. In addition, our focus is on commercial navigation and flood control, with selection, when limited by budget constraints, confined to those that have the highest return on investment.

Question. What criteria were used in the final analysis to reduce your 23 projects to the 11 included in the President's budget?

Answer. Of the 19 new construction starts denied by OMB 13 were denied because, either they had not yet been processed through the Administration's planning and policy review, or they posed policy or environmental problems. The remaining five were deferred to keep construction funding within the allotted ceiling.

POTENTIAL FISCAL YEAR 1990 NEW CONSTRUCTION STARTS—GDM COMPLETION/APPROVAL SCHEDULE

Question. Provide for the record the schedule for completion and final approval of the GDM for each project where the Corps could potentially initiate construction in fiscal year 1990.

Answer. We will provide that information for the record.

[The information follows:]

GDM SCHEDULE—FISCAL YEAR 1990 POTENTIAL NEW CONSTRUCTION STARTS

Project	Authorization date	Division	State	Date of GDM approval
Budgeted new starts:				
Ramapo and Mahwah	1986	NAD	NJ–NY	Sept. 1987
Lock Haven	1986	NAD	PA	Aug. 1987
Sheyenne R. (Horace to W. Fargo)	1986	NCD	ND	July 1987
Sheyenne R. (W. Fargo/Riverside unit)	1986	NCD	ND	July 1987
Nonconnah Creek	1986	MRT	TN & MS	Feb. 1988
Ft. Marion L&D No. 8	1985, 1986	ORD	PA	May 1987
Winfield L&D	1986	ORD	WV	June 1988
Nelsonville	1986	ORD	OH	July 1988
Sims Bayou	1986	SWD	TX	Apr. 1989
Santa Ana River mainstem	1986	SPD	CA	Mar. 1989
Cache Creek settling basin	1986	SPD	CA	Dec. 1987
Other recommended new starts:				
Atlantic Coast Asseateague Island	1986	NAD	MD & VA	Sept. 1989
Hudson River	1950	SAD	FL	(1)
Sarasota County	1986	SAD	FL	Sept. 1989
Lee County, Captive Island	1970	SAD	FL	June 1989
Muscatine Island	C-1986	NCD	IA	July 1989
Little Calumet River	1986	NCD	IN	May 1989
Westwego—Harvey Canal Hurr. Prot.	1986	LMV	LA	Oct. 1989
Cape Girardeau—Jackson	1986	LMV	MO	May 1989
Horn Lake Creek and Tributaries	1986	MRT	TN & MS	May 1989
Mid Rio Grande-Bernalillo to Belen	1986	SWD	NM	June 1986
Bethel bank stabilization	1986	NPD	AK	July 1988
Grays Harbor	1986	NPD	WA	Mr. 1989
Guadalupe River	C–1986	SPD	CA	Nov. 1989
Maalaea Harbor	1968	FOD	HI	May 1982
Other eligible new starts:				
Shinnecock Inlet	1960, 1983	NAD	NY	Aug. 1987

GDM SCHEDULE—FISCAL YEAR 1990 POTENTIAL NEW CONSTRUCTION STARTS—Continued

Project	Authorization date	Division	State	Date of GDM approval
Ft. Pierce Harbor	1988	SAD	FL	Oct. 1989
St. Johns County	1986	SAD	FL	Aug. 1989
Tampa Harbor, Port Sutton	1988	SAD	FL	([2])
Manatee County	1965	SAD	FL	May 1989
Gulfport Harbor	1985	SAD	MS	June 1989
Roanoke River—headwaters area	1986	SAD	VA	June 1989
Loves Park	1986	NCD	IL	Nov. 1988
O'Hare Reservoir	1986	NCD	IL	June 1989
Marshall	1986, 1988	NCD	MN	Aug. 1987
Meramec R. Basin-Valley Park Levee	1981	LMV	MO	July 1987
St. John's Bayou-New Madrid Floodway	1986	MRT	MO	Dec. 1986
Kake Harbor	1968	NPD	AK	Dec. 1980
Zintel Canyon	1965	NPD	WA	June 1989

[1] Anticipate going directly to P&S from feasibility study.

[2] Deferred pending reevaluation of project users.

NEW CONSTRUCTION STARTS

Question. How are you proceeding with finalizing the LCA's for the budgeted new starts? Provide for the record a schedule for signing the LCA's for the 11 projects in the budget, again assuming October 1 availability of funding.

Answer. Assuming availability of funding on October 1, the scheduled signing dated for LCA's for the 11 new construction starts are as follows:

CONSTRUCTION STARTS

Project	Purpose	LCA required	LCA signing
Cache Creek, CA	FC	Yes	Oct. 1989
Lock Haven, PA	FC	Yes	Oct. 1989
Nelsonville, OH	FC	Yes	Not scheduled at this time
Nonconnah Creek, TN/MS	FC	Yes	Oct. 1989
Pt. Marion L&D	Inland Navigation	No	
Ramapo and Mahwah, NY/NJ	FC	Yes	Not scheduled at this time
Santa Ana, CA	FC	Yes	Oct. 1989
Sheyenne River (Horace), ND	FC	Yes	Mar. 1990
Sheyenne River (W. Fargo), ND	FC	Yes	Executed
Sims Bayou, TX	FC	Yes	Dec. 1989—subject to appropriate legislative adjustment of cost estimate.
Winfield L&D, WV	Inland Navigation	No	

ARBITRARY DELAY IN BUDGETING FOR NEW CONSTRUCTION STARTS

Question. Since the administration must approve the chief's report, GDM, and sign the LCA, I can see the possibility where a project that is ready to go could be held back arbitrarily. Could you comment on this concern?

Answer. Under our process for expediting completion of projects which have undergone the efficiencies of cost sharing during the feasibility study stage, we are striving to maintain a constant construction funding level. Assuming all other criteria have been met, it is our intent to recommend all new start candidates to the extent that our budgetary planning ceiling will permit.

Question. Are there any projects, where a GDM is waiting to be approved and local interests have indicated their willingness to sign a LCA, and which meet the other selection requirements, but have not been included in the budget?

Answer. No, sir; we included all such projects for which the GDM's (or reevaluation reports) were scheduled for approval before the budget year.

FISCAL YEAR 1985 SUPPLEMENTAL AND FISCAL YEAR 1987 NEW STARTS

Question. Are there any of the fiscal year 1985 supplemental or fiscal year 1987 new starts which have not been started as yet? If so, what is the reason for the delay?

Answer. Several of these 22 projects are still in planning, engineering, and design. Other reasons include absence of a non-Federal cost sharing sponsor. We will be happy to provide a more detailed answer for the record.

[The information follows:]

FISCAL YEAR 1985 SUPPLEMENTAL AND FISCAL YEAR 1987 NEW STARTS

Project	Status
Fiscal year 1985 supplemental:	
Cleveland Harbor, OH	Engineering and design underway.
Parker Lake, OK	Engineering and design underway.
Gulfport Harbor, MS	Preconstruction engineering and design underway.
Richmond Harbor, CA	Engineering and design underway.
Eight Mile Creek, AR	Engineering and design underway.
Merced County Streams, CA	Engineering and design underway.
Fiscal year 1987:	
Cross Florida Barge Canal Land Acquisition, FL	Initiate land acquisition upon completing management plan.
Randleman Lake, NC	Local sponsor recommended, no Federal involvement.
Miami Harbor Cleanup, FL	Feasibility report underway.
Parker Lake, OK	Engineering and design underway.
Oakland (Inner and) Outer Harbor, CA	Engineering and design underway.
Silver Bay Harbor of Refuge, MN	Not scheduled (recreation harbor).
Agana River, GU	Local financing problems.
Savannah Harbor, GA	Real estate delays.
Black Warrior and Tombigbee River and Tribs, Jackson, AL	Feasibility report underway.
Pearl River, Slidell, St. Tammanys Parish, LA	Engineering and design underway.
Francis E. Walter Dam, PA	Local financing problems.
Tamaqua, PA	Local financing problems.
Halstead, KS	Local financing problems.
Revere Beach, MA	Environmental problems.
Town Brook, Quincy and Braintree, MA	Environmental problems.
Portsmouth Harbor, NH & ME	Bids exceed funding cap of LCA. Scope of project under review at request of local sponsors.

DELAYED FISCAL YEAR 1988 NEW STARTS

Question. There were several of the fiscal year 1988 new starts where the administration was delaying construction for various reasons. What is the status of those projects and what is the schedule for executing a local cooperation agreement and initiating construction?

Answer. Fifteen fiscal year 1988 new starts and separable elements are not under construction. Like the 1985 and 1987 projects there is a variety of reasons, ranging from lack of interest from local sponsor to low budget priority. On a number of these projects, reports are being prepared to form the basis of a decision whether or not to proceed with construction. The status and schedule for each will be provided for the record.

[The information follows:]

PROJECTS NOT UNDER CONSTRUCTION

Project	Status
Maumee Bay State Park, OH	Not scheduled.
St. John River Basin, NE	Not scheduled.
Waterloo, IA	Not scheduled.

PROJECTS NOT UNDER CONSTRUCTION—Continued

Project	Status
Kissimmee River, FL	We are exploring within the administration whether there is an opportunity at this time to proceed with the project given the President's new initiatives.
Miami River Bank, FL	Funds for the project expired before the local cooperation agreement could be executed and the moneys obligated.
Alamogordo, NM	Local interests have declined to participate in the construction project.
Acequais Irrigation System, NM	The local cooperation agreement will be negotiated and construction accomplished in each year as directed in law by Congress.
Gallatin County Streambank Erosion, Area I, Ohio River, IL	Funds are being used to prepare a report on which decision can be made whether or not to proceed with construction.
Campground Lake, KY	Funds were used to prepare a report which concluded the only viable alternative is essentially a single-purpose water supply project in which there is no Federal budgetary interest.
Kanawha River at Charleston, WV	Funds were used to prepare a report which, although still in the review process, is expected to recommend no further Federal action.
Kanawha River at St. Albans, WV	Funds were used to prepare a report which although still in the review process, is expected to recommend no further Federal action.
Muck Levee, IL	Funds were used to prepare a report, which was completed in October 1988 and found no economically justified alternative.
Salyersville, KY	Funds are being used to prepare a report on which construction decisions can be made.
Indian River County—Vero Beach	Scheduled to be advertised in April 1990 and the LCA will be executed shortly before that.

Question. Last fall, President Bush stated that he would set "as a National goal, no net loss of wetlands." He further said "that wetland preservation should be a priority and should enjoy the same level of importance as other responsibilities of the U.S. Army Corps of Engineers, including navigation, flood control, and irrigation." What priority and treatment is this Administration prepared to give the wetland loss problem?

Answer. The Administration supports the goal of no overall net loss of wetlands; however, until the Domestic Policy Council's interagency wetlands task force is convened and determines a course of action, the Corps cannot commit to any specific program for wetlands. In the meantime, we have recently entered into an agreement with the key Federal agencies involved with wetlands to use a consistent methodology for delineating wetland boundaries and have reached agreement with the EPA on permit enforcement and other matters relating to the regulatory program. We are also seeking supplemental regulatory funding to enhance our enforcement efforts, to provide much needed training on the use of the delineation manual, and to develop and refine information needed in the decisionmaking process when wetlands alteration and mitigation is involved. We have also entered into an agreement with the Department of the Interior to cooperate in the North American Waterfowl Management Plan and are working with the National Marine Fisheries Service to develop a national program to enhance fisheries habitat, which would include wetlands construction. Finally, the Corps also has an extensive, ongoing wetlands research and development program that has already provided much information on wetlands.

Question. How can this committee or the Congress best proceed to get the support and backing to the Administration on programs which would begin to address this critical national problem?

Answer. Several congressional committees and various members of both Houses have expressed their concern for wetland losses in this country. The message is clear that Congress wants to address this problem. The message from the President is that he is also concerned about wetland losses. That is why he has directed the Domestic Policy Council to establish an interagency wetlands task force to develop a coordinated position for the Administration. Once this is accomplished, the Administration will be able to better address needed programs for wetlands protection and restoration. Whatever the recommendations are, they will require extensive coordination with and the support of Congress to facilitate and expedite any plan of action and/or program, regardless of whether additional authorizing legislation is ultimately proposed.

LOW-USE COMMERCIAL AND RECREATION HARBORS—25,000-TON CRITERIA

Question. Isn't the 25,000-ton criteria for harbor maintenance arbitrary? What alternative criteria might have been selected, and with what impact?

Answer. The 25,000-ton threshold is indicative of projects that have primarily localized benefits as compared to ones with regional or national outputs. They are primarily used by recreational boaters, commercial fishermen and charter boats. In prioritizing the budget request, the projects are assigned a relatively low priority when compared to other, higher volume harbors. An alternative amount of tonnage would increase or decrease the number of projects affected. Alternative criteria other than tonnage could have been used, such as type or value of commerce, average annual maintenance cost, benefit-cost ratio, or a combination of these. Each of these criteria would require assignment of a numerical limit, which could be argued to be arbitrary. The associated impacts would vary, depending on the limit that is chosen. Factors other than value-based criteria could be considered, such as the impact on employment conditions, availability of alternate modes of transportation, or distance from the nearest harbor of refuge. In developing the O&M budget request, tonnage statistics are a readily available source of information that can be applied in a uniform manner in prioritizing all navigation projects.

OPERATION AND MAINTENANCE REDUCTIONS

Question. Mr. Page, your February 2nd memorandum to the Corps asked them to review ways to "ameliorate" the impact of these reductions on recreation and harbors. Can you explain this in a more definitive way?

Answer. Yes, I can. The Corps is pursuing several measures:

Revised criteria for recreation closures: reducing the number of candidates for closure from over 600 sites to about 100 sites and estimated savings from $34 million to $1 million.

Revised criteria for harbors: reducing the number of candidates for cessation of dredging from 74 to about two dozen and estimated savings from $49 million to about $8 million.

A combination across-the-board in O&M of deferral of maintenance and intensive management actions—with savings of $70–75 million.

Seeking a broad range of measures to maintain service levels that do not rely on Corps funds and manpower.

Question. What other alternatives are there to accommodate the proposed reductions in the operation and maintenance program? Can you tell the committee, specifically, how the Corps proposes to carry out the reductions reflected in the 1990 budget?

Answer. As I stated earlier, we now expect to achieve a total estimated cost savings of $1 million and $8 million. Respectively, through recreation site closures and harbor maintenance cuts. To achieve the remainder of the required reduction of $83 million, each division will reexamine its entire O&M program, focusing on deferrable maintenance work and other items of a less critical nature. This will require a careful review of requirements for expenditures for dams, navigation structures, roads, equipment, disposal facilities, engineering studies, water control, instrumentation, hydropower, safety, real estate, energy and security.

OPERATION AND MAINTENANCE REDUCTION FROM FISCAL YEAR 1989

Question. Can the Corps accommodate the near $90 million reduction below the current fiscal year without significant adverse impact on other areas?

Answer. We will have to defer maintenance and, over the course of the budget year, implement intensive management actions across-the-board in O&M. I have already requested General Kelly to develop a plan for intensive management actions to be implemented in fiscal year 1990. The deferrals, together with other concerns I have mentioned—the impact of disposal of dredged material far offshore in the ocean—concern me very much.

OPERATION AND MAINTENANCE BUDGET

Question. What level of funding for Operation and Maintenance did the Corps request?

Answer. Sir, our total O&M program proposed for fiscal year 1990 was $1,410 million.

OPERATION AND MAINTENANCE REDUCTIONS

Question. There are concerns that regardless of what either you or the Corps come up with, the policy decision has already been made to take the reductions in the areas previously identified in the Reagan budget. What assurances can you give the Committee that this is not the case and that the Corps will have some flexibility to provide funding where needed?

Answer. I can inform this Committee that OMB is aware of the new approaches we have proposed for achieving the $83 million reduction and they have allowed us to proceed.

Question. Can the O&M program be managed without sizable reductions to recreational and small harbor and channel projects similar to those proposed in the Reagan budget?

Answer. Yes, in 1990 I believe it can. However, the restoration of funds for these activities has necessitated a focus on deferrable maintenance and other items of less critical O&M work. Obviously, such action puts off requirements until the future when it will be more costly and will lead to further deterioration.

Throughout the year, however, divisions will adjust their programs to reduce the adverse impacts of the deferred maintenance by means of intensive management actions including: (a) Reductions in the number and/or scope of activities at those recreation areas that remain open, such as frequency of trash collections, interpretive services, and work shifts; and (b) reexamination of all harbors for practicability of modifying navigation channel dimensions consistent with current usage.

OPERATION AND MAINTENANCE EVALUATIONS

Question. Can you suggest an impartial, fair, unbiased evaluation and review procedure to identify uneconomic projects? What guidelines or criteria should be considered in evaluating projects for elimination?

Answer. In evaluating recreation facilities, the basic criteria the Corps is using as a starting point would include low usage in terms of annual visitor days, similar alternative recreation nearby, high cost at low use areas, minimal facilities, and heavy vandalism. Of course these criteria would be subject to further modification by the District Engineer to meet local conditions. The revised criteria for harbor maintenance are more sharply focused on the role of the harbor in the economy. We are also taking care to insure that communities are not deprived of essential means of transportation, and that necessary Federal functions such as Coast Guard and Defense installations are not adversely affected. More specifically, the revised criteria would exclude funding for recreation harbors with low economic impact, very high cost commercial harbors (costs per ton greater than 100 times the national median), and availability of alternative transportation. Again, final decisions would be subject to modification of criteria to meet special local conditions and would be acted on only after consultation with local officials and Congressional delegations.

OPERATION AND MAINTENANCE REDUCTIONS

Question. What other action could be considered to help offset some of the costs of operating and maintaining recreation projects?

Answer. The proposals I have mentioned earlier will help us out of the fiscal year 1990 budget dilemma. However we need to develop a forward looking posture for the continued O&M of recreation and harbor facilities. Given the resources available to the Corps in a tight deficit reduction environment, we need to be looking at O&M of existing facilities by local governments and the private sector, consolidations to reduce management costs, and even consider leasing for some forms of restricted and tightly controlled residential development where it can contribute to continued O&M of recreation facilities. Of course, legislation has been submitted to broaden the Corps' authority to collect recreation user fees.

WATER RESOURCES DEVELOPMENT ACT OF 1986

Question. Does the Administration support Sections 906 (e) and (f) of the Act which provides that activities to enhance fish and wildlife resources shall be a Federal cost when the benefits are determined to be national?

Answer. The Administration does accept provisions 906(e) and (f) concerning enhancement costs for certain categories of fish and wildlife resources which qualify as providing benefits of national importance.

Question. Does the Administration support Section 907 of the Act which provides that in the evaluation of water resources projects, benefits attributable to environmental quality, including fish and wildlife enhancement, shall be equal to the cost of such measures?

Answer. We support Section 907 of the 1986 Act as it permits worthy environmental measures to be included as a part of a water resources development project without any diminution in the net benefits of the project.

SECTION 1135

Question. Does the Administration support Sec. 1135 of the 1986 Act which authorizes the review of existing projects to determine the need to modify such projects for the purpose of improving the quality of the environment, and a program to demonstrate such modifications are effective?

Answer. The fiscal year 1990 budget does not include funds for Section 1135 activities on the basis that these activities have not been able to compete successfully against higher priority activities for allotment of limited funds.

WATER RESOURCES DEVELOPMENT ACTS OF 1986 AND 1988

Question. Specifically, does the Administration support the following provisions of the Water Resource Development Acts of 1986 and 1988?

Section 1155 of the 1986 Act which provides authority and direction to develop and implement projects for the creation, protection, restoration, and enhancement of wetlands in conjunction with authorized navigation and flood control projects in the lower Mississippi River Valley?

Answer. Funds to support Section 1155 have not been budgeted. Although projects implemented under this section would be associated with navigation and flood control projects, they would not produce additional navigation or flood control benefits. Large budget deficits have necessitated that we prioritize our investments with the highest priorities given to flood control and commercial navigation benefits.

Question. Sec. 3(a)8 and 4(h) of the 1988 Act which authorized a project for the environmental enhancement in Mississippi and Louisiana estuarine areas; and the purchase of 300 acres of land in the Stumpy Lake area of Louisiana for mitigation of fish and wildlife losses?

Answer. The report of the Chief of Engineers on environmental enhancement of these areas, which was the basis for authorization of the project in the 1988 Act, is under review at this time. The Administration's position on the project will be determined as a result of that review.

The authorization in the 1988 Act for the purchase of 300 acres of land in the Stumpy Lake area was a modification of the project for mitigation of fish and wildlife losses associated with the Red River Waterway project. Because this authorization was not based upon a Corps' report, a study on the acquisition of Wildlife mitigation lands is being prepared. That study will provide a basis for determination of the Administration's position regarding this project modification.

Question. Gentlemen, what do you see as the challenges and problems facing the Corps of Engineers' civil works program over the next few years?

Answer. Our biggest challenge is to be as effective as possible in responding to the various competing needs of our program. In these times of budgetary and personnel constraints, particularly for discretionary programs such as ours, we must continuously reassess both our program priorities and commitments. The increases in both the cost sharing and partnership role of a project's sponsor commits us to expedite those projects so that the sponsor may realize the benefits of the project and the revenues or taxes required to pay off its financial obligations. Accordingly, we are seeking to achieve a relatively stable investment level for construction with a balanced study, engineering and design program. We are prioritizing the work funded under the other major accounts and are either deferring the less urgent work or, as the Administration has proposed, seeking additional funds through newly proposed user fees.

CHALLENGES AND PROBLEMS OF THE FUTURE

Question. Budgetary pressures continue to reduce the level of effort in the civil works program in real terms, and the Corps is constantly looking to other Federal agencies for work. Does this concern you? What do you see as the major mission of the Corps of Engineers in the 1990's and beyond?

Answer. There is no doubt that we are operating in a "doing more with less" environment. Despite budgetary reductions, the demands placed on the Civil Works program continue to grow. For example, as projects are completed, our operation and maintenance costs increase. Visitor hours at Corps recreation areas are up 15 percent from 1986. Our regulatory program will be expanded to implement the President's policy of "no net loss to wetlands." We must also find ways to revitalize our navigation infrastructure in support of national economic growth. We cannot afford to "mortgage our future" by delaying overdue rehabilitation and reconstruction of our waterways. Accordingly, we are looking at long-term strategies for insuring that the users of all Corps facilities can be provided appropriate levels of service. One element of our strategy is the need to find ways of placing a larger share of operations and maintenance costs on project beneficiaries, particularly users of Corps recreation facilities. These are some of the challenges we will face in the 1990's as the largest engineering organization in the Nation. Yes, we have a large workload in support of other Federal agencies, the largest being the Superfund and Construction Grants programs of the Environmental Protection Agency. Funds are provided by EPA and we receive additional manpower allocations from the Office of Management and Budget to perform this work. I welcome similar opportunities to support other agencies. Not only will they benefit from our work, but we will benefit by maintaining and expanding our expertise. However, despite this potential increase in support of others, the primary mission of the Civil Works program will always be water resources development.

MANPOWER LEVELS

Question. What percentage of the Corps annual expenditures is for overhead costs? How has it varied over the past 5-10 years?

Answer. Traditionally, the Corps has not measured its overhead on a basis comparable to a private sector firm engaged in similar activities. Accordingly, we do not have a meaningful five-year historical profile of overhead. A private sector firm employs a few standard measures to evaluate overhead or its cost of doing business. The measures include (1) Chargeability (percent of labor charged directly to projects); and (2) overhead rate (all overhead costs as a multiple of direct labor charges). Our preliminary analysis, using fiscal year 1988 expenditure data, suggests that Corps districts are running at levels roughly comparable to what one might expect to see in the private sector. For example, the median chargeability rate among private sector architect-engineering firms in 1988 was 63 percent. The median for Corps activities related to the study, design, and construction of new projects was also 63 percent. The median overhead rate for private sector A-E firms in 1988 was 1.47 percent, compared to the Corps median overhead rate for study, design, and construction of new projects of 1.40 percent. We are continuing our cost of doing business analysis and will perform more detailed studies of fiscal year 1989 and subsequent year expenditures. The continuing analysis and monitoring by the Corps of Engineers of charge-ability and overhead rates is essential in the new partnership era in which we operate. Having made this commitment, I should point out that Corps districts are much more diverse in their activities—ranging from planning to construction to O&M—than would be a typical A-E firm.

Question. What is the Corps' current personnel strength? How many of these people are dedicated solely to non-traditional civil works activities and missions? What is the Corps average personnel grade and salary level?

Answer. The on-board personnel strength as of March 31, 1989, is 28,427. This figure includes all employment categories, i.e., full-time and part-time permanent, temporary, intermittent, seasonal, and worker-trainee positions. Of the 28,181 full-time equivalent workyears allocated to the Corps, approximately1,000 workyears or 3.5 percent of total labor are in support of work for other agencies, such as EPA, FEMA, DOE, and DOT. The average General Schedule grade is GS-9.44, with an average salary of $32,700. The average salary of Wage Grade employees is $29,136.

Question. What can be done to get more dollars into "bricks and mortar" and less into overhead types of expenses? How could the committee be helpful in this regard?

Answer. We are committed to doing everything possible to produce more "bricks and mortar" within a given budget. Cost containment is a primary objective of the Corps of Engineers, in both the military and civil works programs. Control of overhead is a critical element in achieving this objective and the performance measures we have developed in our overhead analysis such as the chargeability and overhead rates, which I have previously discussed, are significant new management tools for the Corps. Additionally, we must challenge our engineers to produce safe, high quality designs which can be implemented at the lowest possible costs; we must be resolute in our commitment to stay on schedule, since construction delays inevitably are translated into higher costs; and, finally, we must be willing to reexamine programming and budgetary criteria to direct spending toward those programs and projects for which the case for continued involvement can be most clearly articulated. As part of our commitment to cost containment, we have instituted several changes already and have more under development. I refer, for example, to the adoption of our new code of accounts and cost estimating techniques and the requirement, at all echelons, for use of an operating budget. We are also reevaluating our methods of accounting for and allocating costs, as well as the need for organizational realignment.

It is in the area of realignment where the committee may be most helpful. The overhead reduction initiatives I have described are being taken within the context of our current organization: A sizable headquarters staff, 11 Divisions, and 36 Districts. There is the potential to reduce overhead by reducing the number of offices administering the program. If our studies confirm this potential, the support of Congress for any reorganization proposals would be essential.

Question. What kind of manpower and dollar savings could be realized through the restructuring or reorganization of your Divisions and Districts?

Answer. Although we have initiated a study of realignment criteria, there are no currently agreed upon estimates of the savings. Certainly, cost reduction could be realized in several areas including the elimination of duplicative administrative positions, consolidation of technical staff, and reductions in non-labor overhead costs such as rent. While restructuring holds open the possibility of substantial savings in both manpower and dollars, this can only be achieved by aggressive action taken with the full support of Congress and the Administration. At the same time, we should recognize that there are benefits which we derive from the present highly decentralized structure of the Corps of Engineers, especially with respect to emergency response and services provided to the Corps partners and customers. In any analysis of restructuring or reorganizing, it is necessary to review the costs as well as the benefits of organizational realignment.

BUDGETARY PRIORITIES

Question. Why is new construction start funding given a higher priority ahead of funds to operate and maintain existing projects where a Federal investment is already in place?

Answer. As stated previously, deciding funding priorities is a difficult challenge, to say the least. However, we believe our priorities would result in the best use of limited Federal funding. We are committed to proceeding with highly justified flood control and commercial navigation new construction starts to which local sponsors make significant financial commitments. In order to do this within our budget ceiling, we have had to take a closer look at the very large amount of funds we spend on operation and maintenance. Intensified management, deferral of maintenance, cessation of Federal dredging of some harbors, and closure or transfer to others of some recreation sites are areas we have identified for possible reduction in our efforts to focus Federal funds where current national needs are greatest.

LOW-USE HARBORS AND RECREATION SITES

Question. I have just received your letter which outlines the revised plan on how the reductions in the O&M program will be addressed. How does this revised plan differ from that proposed in the budget request?

Answer. The revised plan is different in that we are now proposing to close a much smaller amount of recreation areas and cease maintaining a lesser number of harbors.

Question. Will some projects and sites still be closed and, if so, could you describe in layman terms just why it would make sense to close those?

Answer. A limited number of projects will be proposed for closure and cessation of maintenance. We are limiting the candidates to only the most compelling cases where continued operation by the Federal Government is clearly questionable.

Question. With reinstatement of funds for these recreation areas and boat harbors, how much in the way of unidentified savings will the Corps have to come up with during fiscal year 1990?

Answer. Reinstatement of funds for these projects will require a like reduction in other areas of the O&M budget request, since the bottom line cannot change. We still expect to achieve savings of about $9 million from the limited number of recreation area and harbor candidates. Further savings from the deferral of maintenance in the range of $70 million to $75 million will be identified in order to hold the bottom line. During the budget year, the Corps will pursue intensive management initiatives to lessen the effect of the deferral of maintenance.

Question. General Hatch and General Kelly, is it realistic to believe that the O&M program can be managed in such a way that savings of this magnitude can be accommodated without serious impact on the other areas of the O&M program?

Answer. The reductions will impact on other areas of the O&M program, primarily the level of maintenance we are able to accomplish. We will not be able to accomplish all that needs to be done. Some maintenance will have to be deferred. However, I believe we will be able to provide an acceptable level of service that will meet project purposes and provide for basic health and safety of project users. We will continually reexamine the O&M program and, as indicated by Secretary Page, we will incorporate efficiencies to reduce the impacts of the deferred maintenance to the extent possible.

Question. In early April, I received a letter signed by about 20 members of the Senate regarding restoration of funding for dredging these harbors. How should I now respond to their concerns?

Answer. I would suggest the response point out that, in the short run, most of the cessation of maintenance annotated in the January 9 budget will in fact be funded in the revised O&M budget now being developed. In the longer run, however, the pressures on the O&M budget will intensify and, as a consequence, the Corps is attempting to anticipate the inevitable shortfalls by pursuing a strategy to shift a larger share of O&M costs to the direct beneficiaries of the services provided by these expenditures.

BENEFICIARY PAY PRINCIPLE

Question. Mr. Page, last year you described the Flood Plain Management Services Program as follows: "one that helps avoid future losses to life and property but also reduces the need for costly Federal flood control works as well as the demand for other flood-related Federal services such as providing disaster assistance during and following floods. In this sense, growth in the program may represent a reduction in demand for future Federal expenditures." Was any analysis done to see if implementation of a cost recovery system would actually increase expenditures over the long term? In your view, would implementation of a cost recovery system discourage participation?

Answer. There was no specific analysis, however, we don't anticipate increased Federal expenditures resulting from this proposal. Once participants have had an opportunity to consider the benefits of the program and what it would cost to acquire the necessary service without Federal assistance, they are likely to continue to participate.

Question. Can you give the committee some idea of the flood damages averted by this program?

Answer. Because of the considerable expense that would be involved, the Corps has not conducted an analysis of the flood damages averted by the program.

Question. Did the Corps recommend this approach in their request to OMB, or was it mandated in your passback from OMB? In your judgment, was this a wise approach?

Answer. While we did not propose the approach, we fully support its concept. It should enable us to maintain the program while reducing its budgetary impacts.

Question. When do you expect proposed cost recovery legislation to be submitted? What is the likelihood that it will be enacted before the start of fiscal year 1990? If legislation is not enacted, what will be the impact on the programs in question?

Answer. The legislative proposal was submitted to Congress on March 10 1989. We hope it can be enacted quickly. If not, we would continue the program at its reduced funding level until the legislation were passed. In the meantime, the Corps is in the process of developing various options to minimize the impacts.

REGULATORY PROGRAM—COST RECOVERY

Question. Why hasn't a cost recovery system been recommended for the General Regulatory Functions?

Answer. In May of last year we submitted a recommended Cost Recovery plan to the Committees, as directed. We are now reviewing our fee schedule. An internal task force met in February for the purpose of increasing our fee schedule and we are currently reviewing its recommendations.

Question. Do you still concur that fees could be substantially increased to recover approximately 25 percent of the costs of the General Regulatory Functions as included in your May 6, 1988 letter to the subcommittee?

Answer. We believe that fees can be significantly increased but our latest study indicates that, at most, 20 percent of our budget could be recovered through fees. Even this amount, $12 million out of our current $60.4 million budget, would require fees that the public might consider to be unfairly high.

CONSTRUCTION PRODUCTIVITY ADVANCEMENT RESEARCH [CPAR]

Question. Regarding the CPAR Program, if the private sector is not interested in increasing productivity and technological advances through R&D, why should the Federal Government be pushing the industry with this type of program?

Answer. The U.S. construction industry is showing great interest in the CPAR Program and the unique opportunity it offers to them for increasing their productivity, and their overall competitiveness, by developing and applying the results of technological advances through the program. Their response to the initial request for CPAR proposals has been outstanding. The Corps received 145 proposals from a broad cross-section of the industry. Those proposals have been screened down to 56 "best" proposals, far more than we can hope to fund with the fiscal year 1989 funds authorized. It is important to remember that the industry proposers are ready to commit their money—at least 50 percent of the project cost—to R&D results which they see as clearly benefiting them, and which will also benefit the Corps, the Federal Government and the Nation. What the construction industry has lacked up to now is leadership in developing and applying new technology. The Corps, through CPAR, is providing that leadership and the construction industry is responding strongly.

Question. Tell the committee more about the specific goals of the Construction Productivity Advancement Research Program. Do you envision CPAR as a "seed program" to bring the construction industry into the R&D field then allowing the Federal Government to step out? Do you believe that R&D will ever have the interest and priority in the private construction industry that will allow the Corps to terminate their involvement?

How long do you see the CPAR program lasting?

Answer. Most of the U.S. construction industry has long recognized that they must develop and incorporate advanced technologies—materials, equipment, methods—into their day-to-day operations to stay in business. In recent years the industry has had to just about eliminate their previous funding support for R&D—both in-house and by others—because of intense cost competition in construction projects. The interest, rather, the recognition that using advanced technology is essential, is still there, but the industry has lost the ability to go-it-alone. CPAR is a "seed" program and more in that it is providing a leadership focal point for the industry, something that has not existed up to now. The CPAR Program, as presently organized, will be needed until the industry regains its preeminent world position through increased productivity and innovation and a R&D infrastructure is established within the industry to lead technological development and application. It should also be recognized that the Federal Government will obtain substantial returns from CPAR in that, through the industry funding, more beneficial R&D results will be produced than the Government might be able to fund on its own.

Question. What type of philosophy will be used in project selection? Will the approach be to apply available dollars to those proposals that will have the greatest impact per dollar invested?

Answer. CPAR proposals are evaluated against a set of criteria which stress widespread benefit to the U.S. construction industry in terms of increasing productivity and competiveness and benefit to Corps missions and construction costs. Other criteria include the overall cost to the Government, duration of the project and ease of integrating the results into the construction industry. Each criterion is evaluated separately and then all individual ratings are considered together to establish a rating for the proposed project. This ensures that the funded projects will provide the greatest benefit to the industry, the Corps, and the nation for each Federal dollar invested.

PROGRAM SCHEDULE

Question. Has there been any change in the schedule to begin specific joint research projects in the Spring of 1989?

Answer. We plan on authorizing the execution of the fiscal year 1989 CPAR Program shortly after mid-June of this year. Our current schedule is:

May 15,1989—Complete Headquarters review of the 56 proposals forwarded by Corps laboratories.

May 31, 1989—CPAR Executive Committee meets to review proposals and prioritize within authorized funding;

June 5, 1989—Approval of fiscal year 1989 Program by the Director of Civil Works; and

June 7, 1989—Send reprogramming letter to Appropriations Subcommittees regarding funding of the fiscal year 1989 Program.

FISCAL YEAR 1989 SUPPLEMENTAL APPROPRIATION REQUEST

Question. The Corps of Engineers has requested approval to transfer $2.6 million out of the construction program to cover pay cost increases in the General Expenses account. Similarly, $1.1 million would be moved from Operations and Maintenance activities to fund the pay raise in the General Regulatory Functions account. Why are General Regulatory Functions or General Expenses any different from other salary and expense programs of the Federal Government which have had to absorb the entire pay cost increase?

Answer. Direct labor costs are, respectively, 70 percent and 60 percent of the General Expenses (GE) and Regulatory Functions appropriations. Other costs such as rent, utilities, and communications are also relatively fixed. Only about 7 percent of the GE budget and 5 percent of the Regulatory budget are truly "discretionary." Examples of discretionary costs are travel, contract effort, supplies and equipment. The discretionary portion of the budget has been reduced, during past budget cuts, to a minimum. Future reductions or unfinanced pay increases must therefore be absorbed in direct labor charges resulting in personnel cuts.

As a result of the severe fiscal year 1988 budget cut in GE, some items planned for fiscal year 1988 were deferred until fiscal year 1989. The Corps has undertaken a number of management initiatives and productivity improvements in order to reduce administrative costs. In addition, HQUSACE and some Division Offices have implemented a hiring freeze and the HQ has received approval from OPM for an "Early Out" to reduce personnel costs. Operating budgets are so constrained at present that the headquarters is funded at only 70 percent of requirements and several Division Offices are funded at a substantially reduced level than required to adequately perform their mission. If the transfer is not approved, the result will be a further reduction in executive level personnel at a time when the Corps is putting forth substantially increased effort in HQUSACE and Division Offices to implement provisions of the Water Resources Development Acts of 1986 and 1988, reduce project delivery times, perform reviews, initiate studies, etc.

Like GE, General Regulatory is largely labor and cannot absorb the increased personnel costs as a result of the fiscal year 1989 pay raise and FERS without adversely impacting on mission accomplishment. It is especially important to sustain acceptable levels of performance for permit processing and enforcement, in order to maintain public confidence and avoid causing unnecessary delays to private developers. Administration support has recently been received for a Second Supplemental appropriation request for the General Regulatory program, in the amount of $2.2 million, to be derived by transfer from Construction, General. The Administration is working out details for transmitting this supplemental to Congress. This increase is particularly important so that efforts to begin implementation of the President's national goal of no net loss of wetlands will not be deterred due to lack of resources.

Question. What was the total amount of the pay cost increase in both the General Regulatory Functions and General Expenses accounts?

Answer. The total pay cost increase for three quarters of fiscal year 1989 is $1,072,000 for the General Regulatory Functions account and $2,677,000 for General Expenses.

Question. What availability date was assumed in developing your request for a fiscal year 1989 supplemental?

Answer. The Pay Supplemental has historically been approved from May to late July. Meticulous planning permits us to support the anticipated labor costs, taking management initiatives into consideration in drawing down those costs; however, this is done at the expense of the discretionary share, since much of the remainder is for fixed costs which we have little or no control over, such as GSA rent increases. The funds transfer will be used to support critical unfinanced requirements be they labor or other operating expenses, regardless of how late the supplemental request is approved.

Question. What would be the impact if the funds were not available on the date assumed by your request? What would be the impact in each account if the supplemental request was not provided?

Answer. The supplemental funds will be used to support increased labor costs if received early enough. The later in the fiscal year the request is approved, the less the likelihood that it can be used to support labor; rather, it will be used to fund those critical requirements left unfunded as a result of having to use the available funds to support labor.

As previously stated, General Expenses and General Regulatory Functions are largely personnel costs with the discretionary percentage shrinking as budget cuts and increased payroll costs are absorbed. If the GE supplemental is not received, there will be a detrimental effect on the Corps' ability to implement provisions of the Water Resources Development Acts of 1986 and 1988 and respond to new policy initiatives such as speeding project delivery and reducing the "cost of doing business." If the Regulatory Supplemental is not received, the Corps will be less able to maintain acceptable permit processing time and will make the Corps more vulnerable to charges of inadequate enforcement of permit conditions.

Question. The Corps of Engineers has requested approval to transfer $2.6 million out of the construction program to cover pay cost increases in the General Expenses account. Can the transfer from the construction program be made without an adverse impact on contract or project completion schedule?

Answer. Yes sir. We have experienced delays on several projects. This will permit the transfer without any adverse impact on our program.

BRIDGE ADMINISTRATION PROGRAM

Question. The Administration plans to submit a legislative proposal to return responsibility for the management of the Bridge Administration program to the Corps of Engineers from the U.S. Coast Guard.

The fiscal year 1990 budget request includes $2 million for bridge alterations, and $4 million regulatory and permit activities.

Give the committee a brief description of the Bridge Administration program which the Administration is seeking to place under the responsibility of the Corps of Engineers.

Answer. The bridge administration program includes three interrelated functions. Review of applications for proposed bridges and causeways represents most of the workload. The other two functions are regulation of the operation of drawbridges and the alteration of bridges determined to be unreasonable obstructions to navigation. Safety is a major concern of these programs and, in fact, the purpose of the bridge statutes is to protect the nation's waterways and to prevent their impairment as navigable waterways.

Question. What were the problems in getting transfer legislation enacted in the 100th Congress?

Answer. The transfer proposal was included in the House version of the Water Resource Development Act of 1988 but was not included in the Senate version. For some reason, it was taken out of the Water Resources Development Act of 1988 during committee conference.

Question. Can the Corps utilize the $6.0 million budgeted if legislation is not enacted?

Answer. Without the authorizing legislation, we could not apply the funds to working on the Bridge Program.

Question. Does the Coast Guard still retain authority and responsibility for the Bridge Administration program if legislation is not enacted and are funds requested in their budget to continue program activities?

Answer. Yes, if there is no legislation enacted the Coast Guard would retain this program. It is our understanding that the Coast Guard has included funding in their fiscal year 1990 request for continued administration of the bridge program, along with proposed adjustment transferring the program to the Corps, if authorized.

Question. What do you expect the annual funding request to be for this program? Provide a 5-year funding profile for the record.

Answer. Our request for administration of bridge permits for fiscal year 1990 is $4 million and we would expect this to be about $4.2 million in fiscal year 1991, and $4.4, $4.6, and $4.8 million for the next 3 years. The amount for fiscal year 1990 for bridge alterations is $2 million; the amounts for future years would depend on future needs to alter bridges that are obstructions to navigation.

FLOOD CONTROL AND COASTAL EMERGENCIES

Question. Update the committee on the current flood situation around the country.

Answer. We are still experiencing flooding in several regions of the country. However, except for Alaska, the flooding has been minor or localized flash floods due to thunderstorms. Most of the damages from these storms are due to high winds and tornadoes.

Areas affected by the thunderstorms and tornadoes include Northern Louisiana, North Central Texas, Eastern Virginia, North Carolina, South Carolina, and Georgia.

In Alaska flooding has occurred in the towns of Fort Yukon and Circle from ice jams and the breaking up of the ice jams on the Yukon River. Also, there has been minor flooding on the Kuskowim River. This condition for the Alaska rivers is forecasted to end around 4 June.

Two major flood events have already occurred this year and both brought about Presidential Disaster Declarations. The first event occurred in Kentucky during February, due to flooding on the central and western rivers in Kentucky. The second event was the flooding along the Red River in Minnesota and North Dakota starting in late March and continuing into April.

Question. What is the current status of the balance of the Emergency Fund?

Answer. The current unallocated balance of the emergency fund is $29.5 million with about $2 million to be allocated for the costs of the Corps response to the floods in Kentucky and along the Red River of the North.

Question. What are the average annual expenditures from the fund?

Answer. The average annual expenditures over the last 10 years are less than $30 million when our response to Mt. St. Helens is excluded. The total fiscal year 1988 expenditure of about $20 million was the lowest since 1978 and that portion for emergency response activities was the lowest since 1972.

Question. The Budget Appendix indicates that "in the event of a major flood or coastal emergency, additional funds may be requested." Could you explain the Administration's position on a budget amendment or supplemental request to replace any funds borrowed from other accounts for emergency operations?

Answer. If the Flood Control and Coastal Emergency funds are depleted because of a major flood or coastal storm, the Chief of Engineers under Public Law 84-99, as amended, may transfer funds from other Civil Works flood control appropriations to accomplish flood emergency and recovery activities. Appropriations to restore the transferred funds would be requested through the budgetary process.

Question. Do you understand that, in certain regions of the country, the Corps has developed drought management plans for projects at which droopier generation is an authorized purpose?

Answer. Yes, sir; our multiple purpose, power projects are very sensitive to the availability of water in the reservoirs. Prudent management of this resource during periods of projected drought is essential to serving the various, and often conflicting, authorized project purposes, including hydro power generation. Up-to-the-minute evaluations of hydrologic conditions in the watersheds, reservoirs and rivers such as pool elevations, inflow rates, downstream river stages and forecasted and observed rainfall, are applied to the approved water control plan to assure best use of the available water resource. Changing situations, particularly flood emergencies or extended drought periods, require modification of the authorized plans. A drought management plan is an advance planning measure to be available and minimize delays and impacts on project beneficiary if such a plan must be implemented. Generally, these plans would be implemented when a significant risk exists that a drought more severe than the drought used to size the project will occur. As a result, a significant risk exists that the project will not be able to continue to meet its authorized purposes.

Question. Do you also understand that the management plans attempt, in some cases, to "balance out" competing project uses, such as recreation, whether or not that competing use is a project purpose specified in the project authorization?

Answer. Our water control management plans are designed to balance project uses. I should add that recreation is an authorized purpose at all projects where the Corps operates recreation facilities. Even though recreation may not have been specified in the original project authorization, we should also consider the impact on that purpose.

Question. Have these attempts to operate the projects to maximize unauthorized purposes resulted in a decrease in energy available for marketing by the Department of Energy?

Answer. Sir, I have no record of incidence where projects were operated for unauthorized purposes. Again, any unauthorized benefits that may have been derived from a Corps project are only incidental to operations in accordance with the law and our commitments to water supply and power marketing agencies.

Question. Has the Department of Energy, through its power marketing administrations, had to purchase replacement power to meet contractual commitments as a result of these management plans?

Answer. Our power marketing administrations have had to purchase power elsewhere from time to time as a result of drought conditions, but not because reservoir levels were being maintained to accommodate unauthorized purposes.

Question. If these drought management plans are to be followed by the Corps from now on, when power marketing agencies renegotiate their current contract with their customers, would you presume that the contract quantity for energy would decrease, to take account of this decrease in available generation as a result of changes in project management?

Answer. Any revisions in our reservoir management plans to optimize benefits under drought conditions for authorized purposes could result in more or less power generation as compared to previous plans. Power generation would not be diminished in favor of any unauthorized purposes. However, we believe it would be desirable for the marketing agencies to coordinate those sales with the Corps to insure that we both agree on the amount of power available and the risk involved in over contracting for power output.

Question. In your opinion, can power customers whose repayment schedules are premised upon a project management plan which the Corps is no longer following, fairly be made to pay more money for less energy?

Answer. As I previously indicated, drought management plans will be implemented only under conditions of projected severe drought. Generally, projects will be operated to provide fully all of the outputs authorized for the project. As a general rule, the Federal Government should be reimbursed for all separable construction amortization, operation and maintenance costs attributable to the production of power at Corps projects. If drought conditions result in reduced power generation, the principle of full cost recovery would dictate that the unit price per megawatt of energy would go up since our costs would remain essentially the same, regardless of how much power is produced. Similarly, during the more frequent non-drought periods more power can be produced and the unit price per megawatt of energy would go down. However, if a water supply reallocation of storage affects hydroelectric power production, the water supply and electric power accounts are adjusted to compensate for lost revenue due to reduced electric power generation.

Question. If the Federal power customers don't pay, who will repay the project costs.

Answer. Sir, if we should fail to collect reimbursement for separable power generation costs from the power customers, the burden would fall upon the American taxpayer.

Question. Please describe the procedure the Corps of Engineers follows in determining how an unauthorized purpose to which no costs have been allocated should be taken into account in management of a federally authorized water resources project.

Answer. Unauthorized purposes are not a normal consideration in the management of any water resources project if they would create increased costs or have an adverse impact on the project's authorized purposes. In the event an additional, unauthorized project purpose appears to be a practicable modification, the proponent local non-Federal entity is responsible for seeking the necessary legislative authorization.

Question. Please discuss the steps which the Corps takes to assure that consideration of unauthorized purposes to which no costs have been allocated in project operation does not deny project benefits to uses which were considered in the cost-benefit analysis underlying the project authorization, and which have paid a substantial portion of the project costs.

Answer. The development of our operation plans requires a review of the project authorization document, the authorizing Act and any amendments to identify purposes which should be considered and prioritized. Any unauthorized purposes may receive consideration providing they do not increase costs or impact our ability to operate the project according to the law. Commitments to power and water supply customers are not subordinated to any unauthorized purposes. Parties affected by any proposed modifications, which affect project purposes, are informed and public meetings and hearings are held to explain the proposal and solicit reaction and comments. This would serve as a double check to avoid any modifications which would favor unauthorized purposes at the expense of valid users.

CORPS DUE PROCESS PROVISION

Question. This past year, a provision (Section 205) was enacted in the Water Resources Development Act of 1988 to require the Corps of Engineers to provide notice and opportunity for comment to interested parties before implementing any change in management of a project that will result in a reallocation of water use or storage. This provision was enacted to assure that the Corps of Engineers does not make management decisions which seriously affect the interests of authorized project users without providing these users with an opportunity for input.

Please describe the steps which the Corps of Engineers has taken to implement this provision to provide adequate opportunity for notice and comment prior to effecting changes in projected management.

Answer. Short-term changes to meet emergencies are, by necessity, limited in the amount of coordination practicable. When a District Engineer proposes a longer term modification to an existing water control plan to resolve an operational issue, he coordinates with appropriate government agencies and affected parties regarding the proposed change. Consideration is given-to all views and, to the extent permitted by existing laws and regulations and by the physical limitations of the project, those that are practical and conducive to meeting project water control objectives are incorporated in the proposed plan.

Public information and public involvement activities are conducted and the views of all affected parties are solicited. The public meeting, and invited written comments from any individual or group(s) are the most fair and effective means by which the Corps can assure the widest possible representation of interests.

Question. Are you aware of any situations in which notice has not been provided?

Answer. As I stated earlier, the Corps assumes a certain amount of flexibility to meet day-to-day operational needs of the project and its benefiting public. However, I am not aware of any modifications to water management plans that have been implemented without appropriate notices in accordance with the law.

Question Submitted by Senator Burdick

SOURIS RIVER BASIN, ND

Question. What is the status of the Souris River project?

Answer. On January 13, 1989, U.S. and Canadian negotiators agreed on the text of an international agreement which would allow the two governments to undertake this project in accordance with applicable statutory authorities. The agreement was formally initiated on March 20, 1989, and is now awaiting final signature and conclusion pending completion of various legal requirements in both Canada and the United States. We would be happy to provide any additional information the Subcommittee may desire.

Questions Submitted by Senator Sasser

WEST TENNESSEE TRIBUTARIES

Question. With regard to the West Tennessee Tributaries Project, if stream obstruction removal guidelines are used, will the project comply with the Court Order issued by U.S. District Judge Odell Horton? Will the use of these guidelines lower costs and benefit the environment? Will the use of the guidelines reduce the level of flood protection?

Answer. The Consent Decree issued for the West Tennessee Tributaries Project permits construction of the project in accordance with the approved Supplemental General Design Memorandum. This approved memorandum does not include use of the stream obstruction removal guidelines; therefore, use of these guidelines would not comply with the Court Order.

Generally speaking, use of the stream obstruction removal guidelines would lower project construction costs and would provide some environmental benefit. However, a detailed evaluation would have to be made to determine the exact magnitude of those costs and benefits.

Use of the stream obstruction removal guidelines would reduce the level of flood protection provided under the approved plan. However, as noted above, a detailed evaluation would have to be conducted to ascertain the exact magnitude of that reduction.

BIG SOUTH FORK NATIONAL RIVER AND RECREATION AREA, KENTUCKY AND TENNESSEE

Question. With regard to the Big South Fork, does the Corps still plan to purchase the remaining lands authorized to be included in the BSFNRRA?

Answer. All scheduled work at the Big South Fork National River and Recreation Area in Kentucky and Tennessee is fully funded. There are no plans to purchase additional lands without local cost sharing as provided in the 1986 WRDA. Furthermore, Federal recreation development has not been a high budget priority for the Civil Works program in these days of severe competition among projects for limited funds.

REELFOOT LAKE, TN

Question. Is the Corps prepared to move forward on the sediment retention project at Reelfoot Lake in cooperation with the Fish and Wildlife Service and the TWRA?

Answer. No. The Reconnaissance Report for Reelfoot Lake, Tennessee, was not certified for feasibility study because the flood damage reduction output magnitude was a relatively minor portion of the total project outputs. It is our policy that projects which do not rely on high priority outputs for project justification, such as flood-damage reduction or commercial navigation, will not be budgeted for during times of large budget deficits. Therefore, no further studies of Reelfoot Lake will be undertaken at this time.

MILLINGTON, TN

Question. The Corps' Memphis District Office has been working with the Chickasaw Basin Authority and the City of Millington to devise a flood control plan along Big Creek to prevent future flooding. Construction is presently scheduled for 1990. I want to commend the Memphis office for its work in this area, and I urge Corps officials to give expeditious approval to the reconnaissance and feasibility reports when they are submitted.

Answer. The Millington, Tennessee, Section 205 Feasibility Report is being expedited so that construction of feasible flood control improvements may be initiated in early fiscal year 1991.

MEMPHIS FLOODWALL

Question. The City of Memphis and Shelby County Governments have created a Public Building Authority, which has contracted to build a new 20,000 seat multipurpose arena in the shape of a pyramid. This facility will be located just north of the I-40 bridge over the Mississippi River in downtown Memphis. The proposed site for this facility is presently protected by a flood wall constructed with federal funds appropriated in the 1950's. Because of various existing problems and the addition of the Pyramid project, I believe that a permanent floodwall closure will need to be constructed to adequately protect the proposed $60,000,000 arena.

A feasibility study regarding the construction of the permanent floodwall can be completed by the Corps under authority of Section 216 of Public Law 91-611. What plans, if any, have been developed with the City of Memphis and Shelby County to study the feasibility of construction the permanent closure? Can you provide a preliminary cost estimate of such a study?

Answer. To date, no plans have been developed with the City of Memphis and Shelby County officials to study the feasibility of a permanent closure of the floodwall. However, studies could be undertaken using authority of Section 216 of the Flood Control Act of 1970.

A design document, including engineering, economics and environmental feasibility of a permanent closure in the floodwall, could be completed at a cost of about $250,000.

MEMPHIS HARBOR, ENSLEY BERM

Question. Finally, I want to reiterate my many previous requests to the Corps to complete work on the Memphis Ensley Berm project. For reasons stated both in hearings and in this Committee's fiscal year 1988 report, it is crucial that this work be completed. Does the Corps have any plans at present to complete this work?

Answer. We have reviewed the entire situation on this matter and have determined that our previous decision is still valid. The project has not been approved due to the anticipated lack of economic return from the proposed corrective work, the minimal local investment, and the existence of high priority projects competing for limited funds. Implementation of this project would be contrary to longstanding policy that water resources improvements be economically justified. We appreciate your interest in this problem and regret that we are unable to proceed with any action at this time.

QUESTIONS SUBMITTED BY SENATOR DECONCINI

ALAMO LAKE, AZ

Question. Do you intend to proceed with the repair of Alamo Dam without lowering the water level?

Answer. While we have not yet made a final decision, I believe that the necessary repairs can be made without lowering the water level of the lake.

CLIFTON, AZ

Question. I see in the Corps fiscal year 1990 budget request, there is $650,000 for the Clifton flood control project. I want to take this opportunity to thank the Corps for their efforts in working with the Committee to provide Clifton relief from the tremendous floods that have devastated that community in the past. We have taken a unique approach by allowing the planning and design activities for the levee to proceed under a Section 205 authorization and I appreciate the Corps deviating from the norm a bit to expedite this project. I am hopeful, that in the very near future, Clifton will begin to see the fruits of our hard work.

Is the amount of funding requested in the fiscal year 1990 budget sufficient for you to complete the pre-construction activities this fiscal year? If so, when does the Corps anticipate being able to commence construction on the levee?

Answer. The fiscal year 1990 budget request for Clifton is sufficient to complete preconstruction engineering and design scheduled for September 1990. Construction could commence the following November, if funds are provided.

Question. Does the Corps have sufficient authorization to begin construction on the levee portion of the Clifton project?

Answer. The Clifton project is not authorized for construction.

Question. What is the status of the report the Corps is preparing on the total Clifton project? When do you anticipate having Secretary of the Army approval for this report and transmitting it to Congress?

Answer. The Corps report on the total Clifton project is presently under review in the office of the Assistant Secretary of the Army for Civil Works.

ALAMO DAM, AZ

Question. As you know, I have been contacted by the Governor of the State of Arizona concerning the impacts of the lowering of Alamo Lake to repair faulty gates on the dam. I share Governor Mofford's concerns in this regard and I have asked the Corps to look at alternative methods such as using a barge and divers to make these repairs thereby mitigating the potentially adverse impacts to threatened and endangered species as well as the recreation improvements that the state has undertaken at the facility.

Has the Corps made a decision on the method of repair for Alamo Dam?

Answer. Yes, the repairs will be made using a barge and crane with divers to place the bulkhead gate.

Question. Will it entail lowering the level of the lake?

Answer. No, sir.

Question. Is there sufficient funding in the fiscal year 1990 budget request to undertake the necessary repair work at Alamo Dam?

Answer. The work will be prioritized and programmed in accordance with normal budgetary procedures.

Question. When the repairs to Alamo Dam are completed, will the operation of this structure change?

Answer. No, sir. The day to day operation of the dam will not change as a result of the repairs.

HOLBROOK FLOOD CONTROL PROJECT, AZ

Question. What is the status of the Holbrook flood control project?

Answer. We will complete the general design memorandum with the funds provided in fiscal year 1989.

Question. Is there sufficient funding in the fiscal year 1990 budget request for you to proceed at your full capability on this project? If not, what level of funding will be required?

Answer. The Holbrook project is not included in the President's fiscal year 1990 budget. We were funded for completion of preconstruction engineering this year, but we had to perform additional studies and analyses to reduce project costs and to address potential flooding in an area not previously considered. An additional $550,000 will be needed to prepare plans and specifications.

Question. Assuming the Corps has adequate funding, when do you anticipate being able to commence construction activities on this project?

Answer. If the needed additional funding is available in fiscal year 1990, we would be in a position to initiate construction in fiscal year 1991.

BISBEE FLOOD CONTROL PROJECT (SECTION 205), AZ

Question. What is the status of the Corps efforts to address the flooding problems in the city of Bisbee?

Answer. The Los Angeles District is currently developing the study cost sharing agreement with the local sponsor, Cochise County. The reconnaissance report was completed in December 1988.

Question. What is the status of the cost sharing agreement with the local sponsor?

Answer. District representative met with the local sponsor on May 2, 1989 to negotiate the feasibility cost sharing agreement for the study.

Question. When do you anticipate an agreement being completed?

Answer. I expect the feasibility cost sharing agreement to be completed next month to be followed by a request for funds to initiate the design report.

Question. If there is a delay in consummating the cost sharing agreement, is it holding up the efforts to address the flood control problems in that community?

Answer. At this time, we do not anticipate any delays in our efforts to help this community with its flood problems.

NOGALES WASH FLOOD CONTROL, AZ

Question. How is the Corps proceeding on the Nogales Wash flood control project?

Answer. Preconstruction engineering and design began in November 1988, and work is proceeding on schedule.

Question. Is the amount of funding requested for the Nogales Wash project sufficient to keep it on schedule? What is the timeline for this project?

Answer. Funding in fiscal years 1989 and 1990 is sufficient to keep the project on schedule. We expect to complete the General Design Memorandum in September 1990 and to complete plans and specifications in March of 1991.

Question. What can I do to help expedite the construction of the Nogales Wash project?

Answer. The project design is proceeding on an optimum schedule with the funds available in fiscal year 1989 and requested for fiscal year 1990.

FLOOD WARNING SYSTEM FOR MOHAVE COUNTY, AZ

Question. I understand that there is a potentially serious flooding problem in Mohave County, Arizona. Can you tell me what the Corps has done to solve those problems? what has been proposed as possible solutions for the high risk areas of Kingman; Lake Havasu City and Bullhead City?

Answer. We have evaluated potential flood control projects in this area under our Continuing Authorities program but have been unable to justify a project. I understand that local interests in these three communities are interested in a comprehensive flood warning system to give them advanced knowledge to prepare for floods. The Corps has no authority to implement such a system at this time.

LOWER SANTA CRUZ RIVER STUDY, AZ

Question. What is the status of the studies to look at the possible flood control alternatives on the Lower Santa Cruz River?

Answer. We are currently negotiating the cost sharing agreement with Pinal County and expect to initiate the feasibility phase in June.

Question. Is there sufficient funding in the fiscal year 1990 budget request to complete the reconnaissance phase of these studies? When do you expect this phase to be completed?

Answer. Reconnaissance level studies were completed in February 1988. Funds included in the fiscal year 1990 budget request are to continue the cost shared feasibility phase.

Question. Do you have any preliminary indications on the cost/benefit ratio for this project?

Answer. Yes, reconnaissance level studies indicated that one alternative has a preliminary benefit-cost ratio of 1.01 to 1 at 8⅞ percent.

FLOOD PLAIN MANAGEMENT SERVICES PROGRAM

Question. It is my understanding that in the fiscal year 1990 budget request, funding for the Flood Plain Management Services Program has been cut 50 percent, as well as proposing that there be 50/50 cost sharing for these programs. To reduce the ever increasing flood damages in the nation, we must have a well coordinated federal/state/local partnership. It is incorrect to assume that state and local governments do not accept any responsibility for flood loss reduction. Through the development and administration of regulation, planning and mitigation programs, these entities already pick up the lion's share of flood loss reduction efforts.

What is the motivation for the proposed cuts in the Flood Plain Management Services Program?

Answer. Cost sharing the Flood Plain Management Services Program is an extension of the beneficiary pay principle which was reaffirmed by Congress in the 1988 Water Resources Development Act. Demand for services under this program continues to grow strongly each year. Under our legislative proposals, receipts from cost sharing would become immediately available to supplement Federal appropriations. We estimate that these receipts, in combination with budgeted Federal funds, would provide program levels close to those being carried out this year.

Question. In view of the costs of major flood control projects, disaster assistance and rebuilding infrastructure and public facilities following flooding, isn't this program one of the most cost effective the Corps has because it ultimately reduces Federal costs by helping states to mitigate flood loss reduction?

Answer. Yes, the program has been very effective in providing assistance not only to states but to Federal agencies, local land use planners, private developers, and homeowners as well. It has helped to significantly reduce unwise flood plain development, diminish the risk of future loss of life and property, and save the costs of disaster relief during and following floods.

PHOENIX, AZ AND VICINITY

Question. What is the status of the construction activities on the Arizona Canal Diversion Channel project?

Answer. Construction on the Arizona Canal Diversion Channel is proceeding on schedule. Construction is either complete or in progress from Skunk Creek to and including Cave Creek, about 8 miles of channel. At the end of April we advertised for a construction contract for the next reach of channel, from Cave Creek to Dreamy Draw (12th Street). This contract should be awarded in June.

Question. Is there sufficient funding in the fiscal year 1990 Budget request for this project to proceed in a timely fashion?

Answer. Yes, sir. The funding amount of $24,800,000 in the fiscal year 1990 budget is sufficient to maintain our construction schedule.

Question. What steps has the Corps undertaken to resolve the conflicts with the Arizona Biltmore Hotel during construction of the ACDC in that Vicinity?

Answer. Negotiations with the Biltmore are primarily a local sponsor function; however, we are supporting the sponsor by providing analyses of design and construction approaches that will minimize impacts to the hotel. Los Angeles District representatives have met with the managers of the hotel on a number of occasions to discuss these issues. Over the past several years we have also analyzed many alternative structural approaches to the project through the Biltmore area. None of these alternatives have proven to be cost competitive when compared with our approved plan.

QUESTIONS SUBMITTED BY SENATOR HATFIELD

RECREATION CLOSURE CRITERIA

Question. What criteria were used in determining which sites were proposed for closure and how do these criteria apply to these sites?

Answer. The revised criteria now being used by the Corps as a starting point to identify candidate areas are: Low use (less than 2,400 visitor days per year); similar alternative recreation facilities nearby (five miles); high cost considering the low use (more than $10,000) annually); few facilities (less than 10 campsites or picnic stations); and heavy vandalism.

With this as a starting point, the division commanders identified and prioritized recreation areas that should be considered for closure. The candidates resulting from this process are to be discussed with local officials and Congressional delegations.

RECREATION FACILITY CLOSURE CONSULTATION PROCESS

Question. Were local, county or state officials consulted regarding the proposed closures?

Answer. We made a commitment to consult local officials and Congressional delegations before proposing closure recreation areas. The process is getting underway.

RECREATION FACILITY-TRANSFERS

Question. Will local, county or state officials be consulted in the future regarding any plans to transfer maintenance requirements or perhaps actual ownership of these facilities?

Answer. Yes, sir. We will approach state and local agencies about taking over areas. That effort is taking on increased importance this year, and some districts have already begun exploratory discussions. It is worth noting that, of the 4,442 recreational areas at Corps lakes nationwide, 1,873 are currently operated by other Federal, state or local agencies.

ELK CREEK DAM

Question. Follow-up questions on Elk Creek Dam: Because of the unnecessary delays that already have been imposed on this project, does the Corps have the capability to begin developing new engineering plans and specs concurrent with the completion of further environmental analysis in order that the project may proceed immediately to construction once the SEIS process is completed and the last legal impediments are lifted?

Answer. Yes, sir; the Portland District could do concurrent engineering work including plans and specifications to resume construction following the filing of the Record of Decision. However, there are limits to our decision making pending completion of the SEIS. If the Record of Decision supports a decision to construct and there are no dramatic changes based on the environmental analysis, the Corps will immediately proceed to complete engineering plans and specs. The exact schedule, however, will be evaluated in a plan of action report to be completed by mid-June 1989.

Question. Finally, do you know at this moment, or could you provide the Subcommittee for the record, what the total costs to the taxpayers have been resulting from the Ninth Circuit Court injunction of this project, specifically including: the costs to terminate the old contract, the costs of the additional environmental studies, the further administrative overhead required to keep this project on hold for nearly 2 years, and your estimates as to how much a new construction contract will cost to complete the dam at today's inflation rate?

Answer. Sir, we estimate that the total cost to complete the Elk Creek Lake Project will be about $42 million more than it would have been were there no injunction. This includes completing the project at today's inflation rate.

BONNEVILLE NAVIGATION LOCK—REVISED COST ESTIMATE

Question. What is the latest cost estimate for the Bonneville Navigation Lock?

Answer. The revised cost estimate, made in April 1989, is $309,000,000 (October 1988 price level). This estimate including inflation is $335,000,000. The revised cost estimate was based upon a detailed code of accounts analysis produced after the lock contract design had progressed to a sufficient level of detail to allow for a more accurate project cost estimate.

Question. Will the increased cost estimate have any impact on the award of the lock construction contract?

Answer. Contract award may have to be deferred due to the requirement for new authorization based upon the revised cost estimate and project allocation to date. It appears that the scheduled award of the lock construction contract would exceed the cost limitation guidelines specified in the Water Resources Development Act of 1986.

STATUS OF REAUTHORIZATION

Question. What is the status of the Army's request for reauthorization of the Bonneville Navigation Lock?

Answer. Based upon the cost increase General Kelly just mentioned, a new authorization will be required. The Department of Army will submit a legislative proposal in the near future.

DISPOSAL ISSUES

Question. The excavation contract for the Bonneville Lock provides a unique opportunity to place the nearly 3.5 million cubic yards of surplus material with five mid-Columbia Ports, all located within the National Gorge Scenic Area, which could use the spoils for industrial and commercial development purposes compatible with the Scenic Act legislation. However, the draft planning and specification documents propose to vest ownership of the spoils with the excavation company to dispose of at their own discretion within approved sites. In the previous disposal contract for the Lock, the operator actually had to pay to dispose of the spoils. What actions must be taken, whether administrative or legislative, to amend these planning specification documents in order for the public ports to benefit from the spoils? Please cite the applicable statute or regulation.

Answer. Administratively we can provide the opportunity for disposal of the material at the five ports. We can include the ports in the list of approved sites in the specifications if they meet the requirements of the National Environmental Policy Act. The Portland District will continue to work with each of the Ports in accomplishing the necessary evaluations. If the Ports are cost competitive to the other disposal sites they should get the material. Federal Acquisition Regulations Part 7, Paragraph 7.102, 10 U.S.C. 2301, et seq., and 33 U.S.C. 622, requires construction dredging of Federal navigation projects to be accomplished in the least costly manner possible.

Question. Is there any precedent within other Corps projects for such spoils to be directed for public use as is herein being contemplated?

Answer. Sir, we are not aware of any precedent where a public entity was granted priority consideration when the benefit of the placement of the disposal materials was not a stated project purpose.

Question. At my request, District and Division personnel, in conjunction with the Mid-Columbia Ports, have developed approximate cost comparisons of transporting the spoils to up river public ports and other down river sites. I would like to know, how do the costs of any of these disposal alternatives compare to the total cost of the excavation contract itself?

In other words, while the comparative costs for disposing of the spoils might favor the up river public ports sites as the least cost alternative, even if this alternative were determined to be more expensive than the alternative down river sites, wouldn't the difference in cost comprise just a very small fraction of the total excavation contract? If so, how much is the disposal portion of the contract as a percentage of the total excavation contract itself?

Answer. Sir, the remaining excavation will be done under the Lock Construction contracts. As a percentage of that contract, the cost of disposal alternatives vary from five to eight percent.

Question. Are all the proposed public port disposal sites (Cascade Locks, Hood River, The Dalles, Skamania and Klickitat) approved by the Corps and other appropriate state and Federal regulatory agencies? If not, Why? Will they be approved by the time the guidelines and specifications are issued and the excavation contract is let?

Answer. All of the proposed disposal sites have not been approved by the Corps. The Portland District is currently processing regulatory fill permits for sites at the ports of Skamania and Cascade Locks. A permit request at a third site, the Port of Hood River, has been delayed pending resolution of a separate permit violation. We determined a fourth site, at the Port of Klickitat to be upland and does not require Federal regulatory clearances. The fifth port (The Dalles) contains a site previously approved in our project Environmental Impact Statement (EIS) Separate sites from those you specifically referenced (at Cascade Locks and at Hood River) were also previously approved in our project EIS.

We continue to urge the ports to complete all permit actions so their new sites may be considered for the spoil materials. We anticipate that most, if not all, of the permits for the proposed new sites will have completed the Corps' review process prior to the advertisement of the Lock Construction contract on September 1, 1989.

Question. When will the planning and specification guidelines be issued for the excavation contract? When will the actual excavation contract be let—prior to, or subsequent to, reauthorization legislation for the Lock?

Answer. Sir, the lock in-service date is scheduled for March 1993. This requires a bid package for the Lock Construction contract, which will include excavation and disposal of three million cubic yards of material, to be mailed to prospective bidders in September 1989, with bid-opening scheduled for early December 1989. The contract will be awarded in January 1990 with work commencing on the 3½ year contract shortly thereafter.

Since we anticipate that award of the Lock Construction contract will commit funds in excess of the limit established in Section 902 of the Water Resources Development Act of 1986, advertisement will be predicated on whether reauthorization has been enacted.

Question. In earlier Congressional correspondence the Corps indicated that in addition to abandoning the least cost alternative, disposal of the dredge spoils at the public ports might, under a variety of circumstances, cause to enjoin, or delay construction of the Lock. Permitting delays; negotiations between the Ports and the Corps; contractual restructuring because of inland rock impacts; or protests from other bidders were cited as examples. Please discuss in more detail these potential circumstances and explain why these problems don't also exist with the other proposed disposal options.

Answer. Sir, the current bidding approach places the risk of disposal site selection on the contractor. The spoil materials become the property of the contractor and unforeseen problems or difficulties which may arise with respect to disposal operations at the selected site do not become the responsibility of the Corps to resolve. Directing the spoil material to any specific site would increase government liability for damages or claims resulting from problems arising during disposal operations at that site. The competitive atmosphere for disposal site selection is also lost during the bidding phase if a government directed disposal plan is specified. The site owner's bargaining position is enhanced as sole recipient, creating a situation where he could potentially dictate special terms or conditions to the contractor. The result could be higher costs which would be reflected at bid opening of the Lock Construction contract.

The Corps would be required to negotiate separate agreements with each of the five ports with respect to quantity, quality, timing of the material delivery, and port supported spreading operations. Should either our contractor or one of the ports not fulfill the terms of our agreement, resolution of the matter could result in contract claims, litigation, and potential project delays.

Contractual and protest problems could be minimized if the contractor had the option to select from sites previously cleared in our EIS or from other sites he proposed that were approved by the Corps.

ASTORIA EAST END BOAT BASIN

Question. What is the status of the further studies for improvements of the Astoria East End Small Boat Basin?

Answer. We are accomplishing the rehabilitation of the Astoria East End Boat Basin in several phases. Currently, we are advertising the replacement of the east and west wingwalls. A second contract will be advertised this summer to do minor repairs to the north breakwater. Also, we are currently evaluating the extent of deterioration of the sheet pile, rubble filled north breakwater. Our preliminary findings indicate about ten years of life remaining. A study will be required to determine whether we need to repair or replace it. We will continue to monitor the north breakwater and initiate the study at the appropriate time.

Question. Has construction begun?

Answer. Not yet, but bid opening for the east and west wingwall contract is scheduled for June 1, 1989.

Question. What are the expected costs for the improvements?

Answer. The work that is scheduled to start this year will cost in excess of $2 million.

Question. What are the tentative cost sharing arrangements, if any?

Answer. Sir, cost sharing for this work is not required. The Astoria East End Boat Basin is part of the Columbia and Lower Willamette Rivers below Vancouver, Washington and Portland, Oregon authorized by the River and Harbor Act of 1946. It is operated and maintained by the Corps at full Federal expense.

COLUMBIA RIVER FISH BYPASS PROGRAM—LONG-TERM SPILL AGREEMENT

Question. What is the Army position on the long term spill agreement?

Answer. I am committed to Army cooperation in a spill agreement and will ask the Director of Civil Works in cooperation with my office to review this matter and report back to me as soon as possible after the June site visit. Perhaps General Kelley could comment on the situation for 1989.

Answer. For 1989 the North Pacific Division is implementing the spill provisions insofar as the nonpower purposes of the projects are not jeopardized.

FISH BYPASS PROGRAM (STATUS OF FISCAL YEAR 1988 AND FISCAL YEAR 1989 DOLLARS)

Question. Please provide a status report on the $18.3 million of new budget authority which has been included in the appropriations process in fiscal year 1988 and fiscal year 1989 and indicate by year and individual project the amount appropriated and obligated at each facility.

Answer. Sir, the entire $18.3 million has been allocated to the North Pacific Division. The following table provides the amount appropriated and obligated at each project:

BUDGET AUTHORITY FOR NORTH PACIFIC DIVISION

Project	Fiscal year 1988 appropriation	Obligation	Fiscal year 1989 appropriation	Program obligation
Ice Harbor	$290,000		$400,000	$250,000
Little Goose	3,263,000		4,700,000	6,930,000
Lower Granite	3,498,000	$2,721,427	1,600,000	1,600,000
Lower Monumental	1,140,000		1,000,000	620,000
McNary		19,801	1,200,000	1,000,000
The Dalles	510,000		700,000	400,000
Total	8,701,000	2,741,228	9,600,000	10,800,000

Question. In 1988 and 1989 funds were included for expansion of the loading and holding facilities at the Little Goose project. when will those contract be let and what is the estimated completion date?

Answer. Sir, the loading and holding facilities at Little Goose have been awarded in two phases. The Bypass Facilities Phase I was let in December, 1988 and is scheduled for completion in June 1990. Bypass Facilities Phase II was let in April, 1989 and is scheduled for completion in September, 1990. Phase I is slightly ahead of schedule.

Question. Both 1988 and 1989 appropriations measures included funding for permanent gate raise modifications at Little Goose and Lower Granite as part of the improvements to existing bypass facilities. What is the status of the interim and permanent gate raise effort? Are additional funds needed?

Answer. Sir, the Interim Gate Raise modifications have been accomplished with available funds. A decision on requirements for permanent gate raises is pending a review within the Corps. Pending this decision, additional funds beyond those currently available may be required.

Question. What is the status of the new fish transportation barges which were funded?

Answer. Sir, the two new fish barges at Lower Granite Lock and Dam that were scheduled for completion by March and April 1989 are approximately 2 months behind due to an unusually severe winter season and contractor delays.

Question. What is the optimum schedule for completion of the design memo, plans and specs, and construction for design and installation of new screens and bypass systems at Lower Monumental, as was recommended in the Assistant Secretary's July 22 Report?

Answer. Sir, the optimum schedule to complete the Screen and Bypass System is September 1992.

Question. Please provide a status report on the important efforts at McNary Dam to develop extended length screens.

Answer. Sir, we currently are conducting model and hydraulic studies on the optimum length screens at McNary. We plan to obtain sufficient design data to initiate design on prototype screens for one of 14 power units at McNary in June 1989 with completion of plans and specifications in February 1990. The contract for this prototype screen could be scheduled for award May 1990 and completion in May 1991. These screens would then be extensively monitored and tested during the 1991 and 1992 fish seasons. Based on the test results obtained during this period, the screens will be modified and a contract will be awarded for the remaining screens at McNary. This data would also be used for the design of extended screens at the Little Goose and Lower Granite dam projects.

Question. Without any constraints how much funding could be used each year for development and construction of these longer screens?

Answer. Based in our studies and analysis to date we estimate funding requirements as follows:

Fiscal years:	
1990	$1,600,000
1991	1,300,000
1992	500,000
1993	4,500,000
1994	8,100,000
1995	2,400,000

Question. What is the estimated completion date?

Answer. At this time we estimate that the installation of the extended screens could be completed in fiscal year 1995.

COLUMBIA RIVER BASIN DROUGHT OUTLOOK

Question. What is the drought outlook for the Columbia basin?

Answer. Expected Spring runoff for the Columbia basin is about 95 percent of normal, with important tributary forecasts ranging from about 90 to 105 percent. With this relatively good water supply most reservoirs should refill to full or nearly full levels, and downstream flow requirements should be achieved. No serious drought impacts are anticipated.

MALHEUR AND HARNEY LAKES RAILROAD RELOCATION

Question. What is the current status on the Harney County Railroad relocation?

Answer. Wyoming Colorado Railroad, Inc. [WYCO] has signed a sales agreement with Union Pacific Railroad to purchase UPRR's Oregon Eastern Branch line which includes the section of railroad to be raised in the Malheur Lake Project. A sole source justification to qualify WYCO as a sole source contractor is under review in HQUSACE. A draft LCA has been submitted to the State for review and is scheduled to be signed by June. Contract award is scheduled for late Sept. 1989.

Question. Has the cost estimate gone up?

Answer. The cost estimate has not changed.

DOUGLAS COUNTY COST SHARING AGREEMENT

Question. This fall, two agencies from the State of Oregon, together with representatives of the Secretary of the Army General Counsel and U.S. Army Corps, successfully negotiated model cost sharing language which would protect the financial interests of the Federal Government and at the same time address a state constitutional bar against incurring unlimited indebtedness. The negotiated cost sharing agreement was made possible by language which was included in Section 1962d-5b(a) of Title 42, and amendment to the Water Resources and Development Act, that allows for such variances where state constitutional impediments exist.

While at the time this language was negotiated it was known by all parties that it was to apply to several pending county-sponsored projects in Douglas County, Oregon, we substantially have been told by Corps legal staff that the provisions do not apply to county governments and currently no effort is being made to draft cost sharing language that will allow these projects to proceed.

Please provide a full accounting of the Corps' legal opinion, together with comments from the Secretary of the Army General Counsel, as to why county governments, which are endowed by the Oregon Constitution and like state agencies are limited by the constitution in the level of indebtedness they are allowed to incur (Article XI, Section 7), are not also offered under Section 1962-d 5b an opportunity to negotiate language which would protect both the Federal and county interests, and which would permit these important projects to proceed.

Answer. The counsel for the Army and the counsel for the Corps who assisted in negotiating the accommodation with the State of Oregon submit the following response.

The accommodation that the Army recently reached with the State of Oregon concerns projects to be sponsored by State agencies with appropriations of the State legislature. That accommodation was possible because of a recent amendment to Section 221 of Public Law 91-611 concerning local cooperation agreements. The amendment allows the Army to recognize in local cooperation agreements that the obligations undertaken by the project sponsors in those agreements, whether a county or a state, do not bind the appropriations of future State legislatures. The amendment applies to funds provided by State legislatures only and does not apply in cases where project sponsors receive funds from other sources independent of the State legislature as is the case with the Douglas County projects. Accordingly, an accommodation such as was reached with the State of Oregon is not possible with Douglas County, and the solutions to this problem must be explored. The Department of the Army is receptive to further discussions with the County in this regard.

A further discussion of the legal considerations governing this circumstance follows.

Section 221 of Public Law 91-611 prohibited the Secretary of the Army from initiating the construction of any water resources development project to which the section applied until each of the sponsors for a project entered into a legally enforceable agreement with the Secretary in which the sponsor agreed to furnish the required local cooperation for the project. The statute required non-federal public interests who served as project sponsors to unconditionally participate in a project and to enter into contracts with the Secretary in which they agreed to provide without qualification or limitation all elements of local cooperation specified for the project, including any funding necessary for construction, operation, and maintenance of the project. However, it soon became apparent that some project sponsors were unable to enter into the agreement required by section 221, because of state constitutional or statutory provisions that prohibit the obligation of funds of future legislatures. This problem was addressed by section 912(a)(2) of the Water Resources Development Act of 1986, Public Law 99-662, which amended section 221 to provide that "[i]n any such agreement entered into by a State, or a body politic of the State which derives its powers from the State constitution, or a government entity created by the State legislature, the agreement may reflect that it does not obligate future state legislative appropriations for such performance and payment when obligating future appropriations would be inconsistent with State constitutional or statutory limitations."

The amendment to section 221 made by section 912 removed what was perceived as a major impediment to the construction of water resources development projects. It allowed states to enter into local cooperation agreements for projects in cases where state sponsors previously were precluded from entering into such agreements because of state statutory or constitutional prohibitions. These prohibitions varied in specific content from state to state, but generally had the effect of limiting the obligations a state contracting official could incur in a contract to the amount of appropriations that were currently available to liquidate those obligations. The change in law was viewed as an acceptable compromise by Congress—one that struck a reasonable balance between absolute protection to the Federal Government and a return to the law in existence prior to the enactment of section 221 when sponsors were only required to furnish non-binding assurances for projects. The amendment to section 221 made by section 921 creates a limited exception to what was formerly a requirement for project sponsors to participate absolutely and without qualification in a project. As indicated by the statutory language, the amendment applies to funds provided by State legislatures only and does not apply in cases where project sponsors receive funds from other sources independent of the state legislature, such as revenues of a county.

IN-LIEU INDIAN FISHING SITES

Question. Public Law 100-581, Title IV, enacted the Columbia River Treaty Fishing Access Sites in an attempt to resolve some long standing questions about Indian land claims. Although fiscal year 1990 funds have not been budgeted for implementation or preimplementation activities, are other funds available to be redirected or reprogrammed for implementation of this statute enacted last year?

Answer. Yes, available Operations and Maintenance (O&M) funds will be used to continue pre-implementation activities in fiscal year 1990.

Question. Are Tribes and local communities authorized by that law to receive funds from the Corps for their own planning activities associated with the Act?

Answer. No. There is no language in the statute which authorizes the tribes or local communities to receive funds to support their own planning activities associated with the Act.

Question. Please provide the Subcommittee the Corps' and the Department of the Interior's position statement on this legislation at the time it was passed by Congress.

Answer. From a strictly legal perspective, the Corps position was that it had met legal obligations regarding in-lieu fishing sites. However, we acknowledged a continuing responsibility regarding a 1972 settlement agreement with the Tribes which called for the Corps to submit a legislative proposal to authorize an acquisition of additional fishing sites. A proposal was submitted in 1974, but was not enacted by the Congress. We strongly opposed Title IV of the enrolled enactment because its unilateral designation of certain lands for access sites did not sufficiently consider conflicting land uses, site development feasibility, overall public interest, and interests of the Tribes.

I must defer to the Department of Interior with regard to its position on this legislation.

Question. Please provide a current assessment of those sites identified by the legislation which are unlikely to be controversial and may proceed quickly.

Answer. We anticipate little controversy at the Bonneville Area office, Rufus, North Shore, Goodnoe, Pasture Point, Rock Creek, Moonay, Pine Creek, Alderdale, and Alder Creek sites. We have, however, not determined the development suitability of these sites. Similarly, we anticipate no controversy in the conduct of facility improvements at the existing in-lieu sites as required by Sec. 401 (b)(3). This section requires the Corps to make improvements at existing in-lieu sites including but not limited to dredging at the site at Wind River, Washington, and constructing a boat ramp on or near the site at Cascade Locks, Oregon.

Question. Those sites identified by the legislation for which jurisdictional conflicts are known or anticipated.

Answer. Jurisdictional conflicts occur at the North Dalles site and Maryhill site as they are not owned in fee by the Federal Government. Site delineations at the LePage and Sundale sites appear to include portions of land not administered by the Corps. Jurisdictional problems also occur at three sites which are presently held in fee by the Corps and are under lease to state and local governments for recreation and other purposes. Specifically, the Crow Butte site is leased to Washington State Parks for recreation purposes, a part of the Faler Road site is leased to Boardman Parks and Recreation District, and parts of the Faler Road site are leased to the Boardman Parks and Recreation District and the City of Boardman.

Question. Any alternative sites not included in the legislation which might be considered to resolve the conflicts yet meet the intent of the Act.

Answer. Alternative sites may exist. Alternatives have not been identified to date, however, and any attempts should involve extensive coordination with the tribes. In several cases, adjustments of site boundaries could minimize conflicts and meet the intent of the act. Two specific cases include the Crow Butte site in Washington and the Preachers Eddy site in Oregon. Existing public recreation facilities are included within these site boundaries. Similar problems occur at six other designated sites. Movement of sites in either an upstream or downstream direction and subsequent development could minimize the impact on existing public facilities. However, the statute incorporated by reference the sites delineated on the numbered map sheets. As a result, an amendment would be necessary to designate alternative sites.

Question. Finally, please discuss any other elements of the legislation of interest or concern to the Corps, such as the status of implementing regulations, relations with local communities, etc.

Answer. Sir, implementation of this law is complicated by three factors. First, the designated sites may conflict with existing land uses and established public use patterns in the region. Most of the sites to be administered as fishing sites are currently being used for other purposes, primarily, public river access and recreation. Second, there may be resource constraints (cultural or biological) and physical constraints of sites selected for development for treaty fishing purposes. Third, the statutory language appears to go beyond the intended purpose in some cases. In particular, Sec. 401(e) vests the Secretary of the Interior with the right of first refusal to accept any Federal land to be excessed, sold, or leased adjacent to Bonneville, The Dalles, and John Day pools. The right of refusal applies for the Bonneville pool area until such time as 360 acres are provided. However, there is no acreage limit on The Dalles and John Day Pools. This appears inconsistent with the objective of the legislations to provide a total of 400 acres of land to fulfill the terms of the 1939 agreement.

ASTORIA TONGUE POINT PROJECT

Question. What is the status of the Local Cost Sharing Agreement with the Oregon Division of State Lands regarding the channel deepening study for a turning basin at Tongue Point?

Answer. The draft LCA has been negotiated between the Oregon Division of State Lands and the Portland District, Corps of Engineers. The negotiated draft LCA is now under review in my office.

Question. How much was spent last year to complete the feasibility study?

Answer. Sir, the feasibility study cost is approximately $317,000, of which $158,500 is federally funded. These figures may be adjusted on completion of the final audit.

Question. What work remains to be completed by the Corps?

Answer. The Department of the Army must complete its review of the draft LCA, and any changes to the LCA must be renegotiated with the State of Oregon. A recommendation then will be made to the Assistant Secretary to proceed with construction of the project contingent on execution of the agreement by the project sponsor and the Assistant Secretary of the Army for Civil Works.

TILLAMOOK JETTY REPAIRS

Question. What is the status of the Tillamook jetty which may have breached and be in need of repair?

Answer. Normal deterioration has resulted in loss of an estimated 426 feet of the outer end of the jetty.

Question. Has a preliminary assessment of the situation been conducted?

Answer. Sir, a reconnaissance study to determine the extent of damage, remedial measures and potential costs is scheduled for completion by July 1, 1989.

Question. If so, what are the findings and recommendations?

Answer. A preliminary estimate of subsidence to the outer end of the jetty is 426 feet. Cost of repair is estimated at about $10,000,000. Recommendations to repair will depend on findings in the reconnaissance report.

COOS BAY NORTH JETTY REPAIR

Question. Why did it take so long to issue the contract for repair of the north jetty at Coos Bay?

Answer. Sir, we had planned to do the jetty repair this summer and fall, and that is still the case.

Question. What is the status of that contract?

Answer. The contract was awarded on April 28, 1989.

Question. Is it being protested?

Answer. Yes, a protest by the third low bidder was filed shortly after the bid opening, but has now been resolved.

Question. When will the work begin and be completed?

Answer. Notice to proceed was issued to the low bidder on May 12, 1989. Completion is scheduled for November 15, 1989.

Question. What are the anticipated costs for completing the repairs?

Answer. The low bid for this work is $7,762,500.

Question. When will the repairs be completed?

Answer. This contract, scheduled for completion by November 15, 1989, will complete the necessary repairs.

GOLD BEACH PILE DIKES

Question. What is the status of the pile dike project at Gold Beach?

Answer. The pile dike monitoring program began in fiscal year 1984. The aerial and ground photographic coverage show the groins have been effective in slowing and reducing the south jetty shoal movement into the boat basin entrance.

Question. Are those pilings sustaining or have they deteriorated beyond their intended purpose?

Answer. Due to weather and sea conditions after two winters, the outer dike in a three-dike system is one-half its original length. The middle and inner dikes need minor repairs, but are fully functional for their intended purpose.

Question. What are the costs to repair or replace those pile dikes?

Answer. An alternative structural design study of the outer dike is being performed in fiscal year 1989. Cost of repair or replacement of the outer dike will depend on the recommendation of this study. Estimated cost to repair the middle and inner dikes is $75,000.

Question. What are the consequences if they are not tended to?

Answer. Deterioration of all three dikes will continue to the point where they are no longer effective. If repairs are delayed for one season, costs of repairs are expected to increase.

HARNEY CO. RAILROAD ELEVATION

Question. What is the status of the Local Cost Sharing Agreement for the Harney County Railroad elevation project?

Answer. Sir, I expect to receive the revised draft Local Cost Sharing Agreement (LCA) shortly.

Question. Have the Corps and local project sponsors completed the project specifications and agreed on and completed a work plan?

Answer. Sir, we are considering a request for sole source justification which would allow the new owner, Wyoming Colorado Railroad (WYCO) to design and construct the rehabilitation work. It is anticipated that a decision on that issue will be forthcoming by mid-June 1989. Only preliminary design work has been done which include field surveys and investigations for materials sources. The State of Oregon, WYCO and the Walla Walla District met on May 2, 1989 to discuss design criteria and a tentative construction schedule. A joint field survey will be made in May 1989 to determine the amount of existing materials that can be used in the rehabilitation and to agree on the materials source(s). Approvals of the sole source determination and the draft LCA are critical milestones in the work plan.

Question. Are there any cost reestimates for the elevation project, in particular any cost increases, if so, please explain?

Answer. Sir, the revised cost estimate is expected to be completed in June 1989. The May 2 meeting and the site visit will provide needed information in developing the revised cost estimate. The current project cost is estimated to be $5.4 million. We believe that the additional information may result in a lower project cost estimate.

Question. What is the status of the Interstate Commerce Commission procedures necessary to transfer ownership of the rail line?

Answer. Sir, the Interstate Commerce Commission has approved the application filed by the Wyoming-Colorado Railroad Inc., to purchase the rail line from the Union Pacific Railroad. The application was approved on March 29, 1989 with a Service date of April 3, 1989.

Question. Has the issue of "single user" beneficiary been resolved?

Answer. Yes, sir.

DROUGHT PREDICTIONS

Question. Higher than average precipitation in the Pacific Northwest has been offset by unusually high energy demands at the dams due to a severe cold snap this winter. What is the current status and projected forecast for water supply through the summer and remainder of 1989?

Answer. The February cold spell aggravated an already deficient reservoir situation by causing reservoirs to be drawn down even further, in order to meet the exceptionally high electrical loads that were experienced. Despite the low storage conditions, however, a forecasted spring runoff that ranges from 90 to 105 percent of normal should result in most reservoirs recovering from the deficit condition and reaching full or nearly-full levels this summer. Significant filling has already occurred during April and the first half of May. Based on our current assessment, water supply for the rest of 1989 looks good, and our earlier concerns for possible drought conditions in 1989 appear to be alleviated in the Columbia Basin.

WILLAMETTE RIVER BASIN STUDY

Question. Last year Congressman Peter DeFazio secured an authorization study for the Willamette River Basin specific to the availability of water in the drainage and competing uses. Please describe the proposed study in its entirety.

Answer. Many miles of levees and channel improvements have been constructed for flood protection in the Willamette River Basin. Thirteen Corps' reservoirs have been built to control floods, generate power, and provide water for navigation and irrigation. Some of these projects were constructed 40 or more years ago when authorized project purposes were limited to only a few functions. Local interests have expressed a need to re-examine the allocation of storage and operation of these reservoirs with a view toward authorizing additional project purposes and modifying reservoir operation. The study will concentrate on operation of the Corps' existing reservoirs. Allocation of stored water, methods of reservoir operation, and other congressionally authorized project purposes will be reexamined to determine if the system can better serve current and anticipated future water resource needs.

Question. What is the fiscal year 1990 and future funding capability?

Answer. Our capability is $600,000 for the study. Future requirements will depend on the outcome of the reconnaissance phase.

Question. When will the study be completed?

Answer. Sir, this reconnaissance study is expected to take 18 months.

COLUMBIA RIVER CHANNEL DEEPENING

Question. Initiation of a reconnaissance study for deepening of the Columbia River Channel has been requested by the Port of Portland. Please provide a description of the proposed study.

Answer. Sir, the proposed Lower Columbia River Navigation Channel Reconnaissance Study would evaluate varying channel depths and width of the existing 40-foot deep federal navigation project from its mouth to the Port of Vancouver, Washington, about 108 miles, and the lower eight miles of the Willamette River from its confluence to the Port of Portland docks. This study would provide a preliminary determination as to what modification to the existing channel project might be economically and environmentally justified for accommodating the larger deep draft vessel currently using, and projected to use, the river.

Question. Capability statement for fiscal year 1990?

Answer. We have no capability pending a Congressional Resolution authorizing the study.

Question. A tentative outlook as to the likely benefits.

Answer. We would expect significant benefits for deepening the channel based on lower commodity shipping costs that would result from reduced delays and light loading of deep-draft vessels. The major question to be answered, of course, is whether benefits will exceed costs.

Question. And drawbacks that might be associated with a channel deepening project of this kind.

Answer. Sir, some of the concerns are the availability of dredged material disposal areas and environmental impacts associated with dredging and disposal areas.

BPA SPILL AGREEMENT

Question. Operation of the Columbia River hydrosystem for years has been an extremely contentious issue especially regarding traditional Indian fishing rights and more recently the impacts on juvenile salmon. Because of the nearly two decades of debate about these issues the recently announced long term spill agreement between the Bonneville Power Administration and state and local agencies and the Tribes is somewhat of an historic event. Why did the Corps elect not to sign the agreement?

Answer. The North Pacific Division Engineer did not sign the agreement because it calls for long term commitment to measures, including spill and fish bypass facility construction, that have yet to be shown to be nationally justified mitigation measures. We will further discuss this issue with regional interests during a visit to Portland planned for early June.

Question. Will you comply with the short term and long term provisions anyway?

Answer. The North Pacific Division Engineer has agreed to implement the spill provisions for 1989. His decision next year will depend on a review of all nonpower effects, fish passage and hydrological data that will be collected by next spring. Futhermore, the Director of Civil Works and his staff, in cooperation with Secretary Page's staff, will examine the agreement and report back on the relationship of the spill agreement to the Army program. This will be done as soon as practical following the early June visit. The Army is committed to cooperation in a spill agreement.

Question. If a disagreement were to arise regarding spill at any one of the facilities, who has ultimate authority to spill?

Answer. The Corps has the ultimate authority for spill. This is inherent in our authority to operate the projects.

Question. If it is with the Corps, will it be your policy to consult with BPA and the locals prior to any action being taken?

Answer. Yes, sir.

COLUMBIA RIVER SLOUGH

Question. What is the status of that analysis?

Answer. Sir, the City of Portland has been studying water resources problems of the Columbia Slough for over a year and is nearing a completion of its study.

Question. Is any further study under way or planned?

Answer. Although a new Corps study was authorized by Senate Resolution adopted September 29, 1988, no funds have been budgeted for Corps studies.

Question. What are the preferred alternatives which have been recommended by the Corps?

Answer. It is premature to address alternatives until we have undertaken the study.

Question. Is discussion still on-going with the city and others about this project?

Answer. Yes, the Corps has been represented on the City's project coordinating committee.

EXPENDITURES IN OREGON

Question. I am curious to know more about what kind of impact the Corps' budget has on Oregon's economy above and beyond the general funding of studies, preconstruction and construction activities that are displayed in each year's budget. For example, how many people are employed by the Corps in all of its Oregon offices and what is that payroll amount?

What are the other major annual expenses such as those for leasing and rental of office space and equipment; for gasoline and in-state travel; and expenses for other services such as printing and publishing?

Please identify in general terms the level of these expenditures and whether they are included as activities within the appropriations for Studies; PED and Construction, or whether they are funded separately.

Answer. Sir, in Oregon we employ about 1,800 people. Their total payroll is approaching $60 million annually. Without attempting a detailed accounting, associated expenditures in Oregon amount to at least $10 million per year. This would be for such items as office space and related expenses, travel, service contracts, etc., but excluding construction contracts. Our expenditures in Oregon are primarily funded as part of our annual appropriations for General Investigations, Construction, General, and Operations and Maintenance, General. The General Expenses appropriation directly funds a part of the North Pacific Division headquarters office in Portland, Oregon.

QUESTIONS SUBMITTED BY SENATOR COCHRAN

MISSISSIPPI-LOUISIANA ESTAURINE AREA PROJECT

Question. What is the status of the Mississippi-Louisiana Estaurine Area project?

Answer. Senator, this project was just authorized in the 1988 act, which became law in November of last year.

Sir, the project is under design now while there is concurrently ongoing the Washington level review of the General Design Memorandum. During this review, the Assistant Secretary of the Army's office is working with the Office of Management and Budget to arrive at a position on an appropriate cost sharing between the Federal Government and the States of Louisiana and Mississippi. Once that issue is settled, the project will be considered in the budget process for construction. But we are actively designing the project, so no time is being lost at this point.

SCHEDULE FOR MULTIPROJECT SOLUTION

Question. What I would like to know is some time table, if you could give me that for the record, of when you expect this to move along and when these individual increments or elements of this overall project will be approved and be constructed?

Answer. The active elements which you are inquiring about are the Caernarvon and the Davis Pond Freshwater Diversion Structures. The construction of the Caernarvon structure is already underway and is scheduled for completion in November 1990. The construction of David Pond is scheduled for completion in April 1995.

QUESTIONS SUBMITTED BY SENATOR DOMENICI

ALBUQUERQUE LEVEES, NM—MIDDLE RIO GRANDE FLOOD PROTECTION, BERNALILLO TO BELEN, NM

Question. Is it accurate that the Corps has expressed a capability to spend $2 million to initiate construction of this important and needed project during fiscal year 1990, should funds be appropriated?

Answer. Sir, subject to the usual qualifications, the capability amount for the Bernalillo to Belen, New Mexico project is $2,000,000 to initiate construction.

Question. Please describe the work that would be accomplished with that money, if appropriated.

Answer. Sir, the first year's funding would be used to complete the design, consumate a Local Cost Sharing Agreement, prepare plans and specifications, and initiate levee construction of the Belen portion of the project. The Belen portion comprises construction of 39 miles of the total 51.5 miles of levee included in the overall project.

BELEN, NM

Question. Provide, for the hearing record, details on the costs and benefits of various alternatives you have examined.

Answer. Sir, the information for three alternatives to the recommended plan to protect the community of Belen from interior flows will be provided.

[The information follows:]

CORPS' FINDINGS FOR ALTERNATIVES TO RECOMMENDED PLAN

[Amounts in thousands]

Alternative (100-year)	First cost	Average annual costs	Average annual benefits
Enlarge existing irrigation canal	$19,576	$1,720	$1,436
Pumping stations	32,000	2,816	1,271
Nonstructural measures	27,000	2,328	1,271

ALBUQUERQUE LEVEES (MIDDLE RIO GRANDE, BERNILLIO TO BELEN) AND BELEN, NM

Question. Would you describe the benefits, if any, that the Albuquerque levees project would bring to the community of Belen?

Answer. The levee project, which we refer to as the "Middle Rio Grande, Bernallio to Belen, project," would provide average annual benefits of approximately $2.5 million to the community of Belen by protecting it from flood flows on the Rio Grande.

Question. Is it accurate that the levees project discussed in the previous question will not lessen the need for a separate Belen project?

Answer. Sir, a serious flood threat is still posed by runoff from intense thunderstorms over the steep escarpment west of the city.

ACEQUIAS IRRIGATION SYSTEM, NEW MEXICO

Question. Am I correct that the Corps has the capability to continue the project in fiscal year 1990, should funds be appropriated?

Answer. From an engineering perspective, the Corps could continue rehabilitation and restoration of the acequias in fiscal year 1990, if funds were specifically appropriated. However, Federal accomplishment of the remaining work is not in keeping with the Administration's budgetary priorities.

Question. Is it correct that you have an fiscal year 1990 capability to spend $2 million in Federal funds to be matched with $667,000 in non-Federal cash, the same level the program had during fiscal year 1989?

Answer. That is my understanding, yes.

COCHITI DAM SEEPAGE—COCHITI WETFIELDS, NM

Question. Would you bring us up to date on the work to solve the Cochiti Dam seepage problem?

Answer. Sir, during fiscal year 1988, an agreement with the Cochiti Pueblo was reached on a plan of design. Our efforts in fiscal year 1989 have concentrated on gathering the base data needed to complete the design of an underground drainage system. We expect to complete a ground water model this summer. With the Pueblo's concurrence, the results of the model will be used to design the drain system. The Pueblo has participated as a full partner in all design efforts. Concurrent with the design, the Corps has been evaluating the information available to explore a negotiated settlement.

Question. I would hope that you do everything you can to meet the January 1990 deadline for completing the design work, then reach a settlement with the Cochitis based on that design, as soon as possible. Is that timetable still a good one?

Answer. Sir, the January 1990 date is still good. A draft design of the drainage system will be completed this summer. This design will be finalized and serve as the basis for one portion of a settlement. Negotiations on the remaining issues of the settlement should be completed by the time the draft design is completed.

SAN JUAN RIVER AND TRIBUTARIES, NM

Question. What is your capability in fiscal year 1990?

Answer. Sir, subject to the usual qualifications, the capability amount to initiate and complete the reconnaissance phase study for the San Juan River and tributaries is $380,000.

Question. Would you please describe the need and problems in this area?

Answer. Sir, the area has a long history, of flooding. Due to significant population growth within the San Juan Basin since 1970, particularly in the urban centers, flooding and related water resources problems are a growing concern. Significant flood damages and disruption of normal community services will occur if solutions are not forthcoming. There are no flood control projects in the San Juan River Basin in New Mexico, although flood fighting activities and construction of temporary flood protection measures have taken place. In a letter dated October 6, 1988, San Juan County urged the Corps to consider flood control measures in the Basin.

ALBUQUERQUE AND VICINITY ARRDYOS, NM

Question. What is the Corps capability in fiscal year 1990 for such a study?

Answer. Sir, the capability for a study of the Albuquerque and vicinity Arroyos, New Mexico area, is currently under review. From an engineering viewpoint, it would appear that $300,000 would be needed to initiate and complete the reconnaissance phase of the study, if funds were appropriated.

Question. Would you please describe in more detail some of the problems of arroyo flooding in the Albuquerque area?

Answer. Sir, due to rapid growth, Albuquerque has extended beyond the limits of existing flood control facilities into the foothills. The steep arroyos which drain the foothills generate high-velocity, sediment laden, "wall-of-water" type floods which not only inundate but also sweep away most improvements in their paths.

PUERCO RIVER, GALLUP, NM

Question. Would you please provide a description of the need and work to be accomplished on the Puerco River at Gallup, New Mexico, project, as well as timetables for anticipated completion.

Answer. Sir, the flood problem in the city of Gallup exists along a 3.5-mile reach of the Puerco River. The hazard is centered primarily on the west end of the city, affecting a rapidly developing urban area and two principal routes of transportation. Damages can occur in this area from floods in excess of the 10-percent chance flood. There have been seven damaging floods in the last 50 years with a 20-year event occurring in July 1972 that caused $1.3 million in flood damages. The project calls for improving 9,650 feet of existing levees, 6,800 feet of channel excavation, removal of a rock knoll which restricts flow, acquisition of approximately 100 acres of flowage easement and environmental mitigation measures on approximately 30 acres of project land. Construction of the Puerco River channel improvement project is scheduled to be completed by September 1990.

RIO GRANDE FLOODWAY TRUTH OR CONSEQUENCES UNIT, NM

Question. Would you please provide a description of the need and work to be accomplished on the Rio Grande Floodway, Truth or Consequences, New Mexico project, as well as timetables for anticipated completion.

Answer. Sir, because of limited channel capacity of the Rio Grande through the city of Truth or Consequences, New Mexico, a significant flood threat exists. The danger stems from high intensity runoff from Cuchillo Negro Creek, which enters the Rio Grande just upstream of the City. The National Economic Development protection plan is for a detention dam on Cuchillo Negro Creek. Completion of the dam is schedule for June 1991.

ROSWELL, PECOS RIVER, NM

Question. Would you please provide a description of the need and work to be accomplished on the Roswell, Pecos River, New Mexico project, as well as timetables for anticipated completion.

Answer. Sir, the Roswell project is a local flood protection project for the city of Roswell, New Mexico. A significant flood threat is posed by the Rio Hondo, a tributary of the Pecos River. Feasibility studies are currently underway on this project, with the city of Roswell providing 50 percent of the study costs. Preliminary studies indicate that a channel Improvement project on the Rio Hondo would significantly reduce the flood problem, with a benefit-to-cost ratio of 1.3 to 1 when analyze at 8⅝ percent interest. The feasibility phase is scheduled to be completed in September 1990.

LAS CRUCES, NM, EL PASO AND VICINITY

Question. Would you please provide a description of the need and work to be accomplished on the Las Cruces, New Mexico (El Paso and Vicinity) study, as well as timetables for anticipated completion.

Answer. Sir, funds in the amount of $370,000 have been requested to initiate and complete a reconnaissance study in fiscal year 1990. Discussions with officials in Las Cruces and Dona Ana County indicate that flooding and related water resource problems in the Las Cruces area are becoming more significant as the city and adjacent areas experience rapid urbanization. This study will identify specific flooding and related problem and investigate potential solutions. The reconnaissance study will be performed in sufficient detail to determine whether future cost-shared feasibility studies should be recommended. There is strong local support for any new initiative which could be made on the behalf of Las Cruces.

Question Submitted by Senator Bentsen

LAKE WICHITA, HOLLIDAY CREEK, TX

Question. The Corps of Engineers is doing work to correct hydrologic deficiencies at the Lake Wichita Dam on Holliday Creek in Texas. I understand that the local people are willing to accept a dam which is the same height as the maximum probable flood, but that the Corps is requiring more than three feet of freeboard above the maximum probable flood. what is the rationale for building a dam which is that much higher than the maximum height of the water that the dam is likely to contain?

Answer. Freeboard accommodates wind generated wave action and allows for uncertainty of spillway operation. The essential issue at Lake Wichita Dam is the appropriate degree of risk and who makes this determination.

SUBCOMMITTEE RECESS

Senator Johnston. Thank you very much. If there is nothing further, the subcommittee will stand in recess subject to the call of the Chair.

[Whereupon, at 4:15 p.m., Wednesday, May 3, the subcommittee was recessed to reconvene subject to the call of the Chair.]

ENERGY AND WATER DEVELOPMENT APPROPRIATIONS FOR FISCAL YEAR 1990

THURSDAY, MAY 4, 1989

U.S. SENATE,
SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,
Washington, DC.

The subcommittee met at 2:10 p.m., in room SD-192, Dirksen Senate Office Building, Hon. J. Bennett Johnston (chairman) presiding.

Present: Senators Johnston, Burdick, DeConcini, Reid, Hatfield, and McClure.

DEPARTMENT OF THE INTERIOR

BUREAU OF RECLAMATION

STATEMENT OF MANUEL LUJAN, JR., SECRETARY OF THE INTERIOR

ACCOMPANIED BY:

- DOYLE FREDERICK, ACTING ASSISTANT SECRETARY, WATER AND SCIENCE, DEPARTMENT OF THE INTERIOR
- C. DALE DUVALL, COMMISSIONER, BUREAU OF RECLAMATION, DEPARTMENT OF THE INTERIOR
- ANTHONY L. ITTEILAG, DIRECTOR OF BUDGET, DEPARTMENT OF THE INTERIOR

OPENING STATEMENT

Senator **JOHNSTON**. This afternoon the Energy and Water Subcommittee continues its hearing on the fiscal year 1990 budget request. We will hear testimony today from the Secretary of Interior and the Bureau of Reclamation.

The budget before us continues the administration's policy, started in 1988, to place highest priority on those construction activities that are substantially complete, while ignoring several high priority projects long supported by the Congress.

The staff informs me that it will take around $60 million to bring the schedules of those projects back in line with what was anticipated when we acted on the 1989 bill.

The overall budget situation regarding various projects and programs of the subcommittee is not good. If we do not receive sufficient 302(b) budget allocation, I do not see how we will be able to accommodate the desires of the committee members, much less the requests from other members of the Senate. We always try to take care of our committee members, but it does not look good this year.

So with that, I want to welcome Secretary Lujan and Commissioner Dale Duvall of the Bureau of Reclamation, to review the programs and activities under their jurisdiction.

Senator Hatfield, did you have any opening comments?

Senator HATFIELD. Not at the moment. Thank you, Mr. Chairman.

Senator JOHNSTON. Mr. Secretary, we welcome you to the committee. You may proceed.

INTRODUCTION OF WITNESSES

Secretary LUJAN. Thank you very much, Senator. I am happy to be here.

Let me first introduce the people who are joining me today at the table. We have Doyle Frederick, who is Acting Assistant Secretary for Water and Science; we have Dale Duvall, Commissioner of the Bureau of Reclamation; and Tony Itteilag, who is the Director of the Department's Office of the Budget.

I would like to submit my testimony for the record, and then I would like to speak briefly to it.

Senator JOHNSTON. Yes, please do.

Secretary LUJAN. Thank you, Mr. Chairman.

DEPARTMENT OF THE INTERIOR AGENDA

The President and I have jointly agreed to an expanded 10-point agenda for the Department of the Interior, which includes stewardship, territories, education, war on drugs, and all of the different responsibilities that I have as Secretary of the Interior. But I would like to expand on a few of these themes from my direction of the Department of the Interior and its employees.

First of all, of course, the most important part is stewardship—to recover those resources, to harvest the resources, but to do it in an environmentally sound manner.

Education—is another one of the initiatives we place a high priority on, and we will use the Department's resources to help in any way that we possibly can.

The war on drugs—we want to be aggressive soldiers in the Nation's war against drugs, and use, again, all the resources of the Department for that benefit.

Domestic resources—we will manage the multiple-use Federal lands and waters to provide the widest range of benefits for those domestic resources to the American people, including preservation, recreation, energy, minerals, water supply, and food and fiber.

Partnerships—we want to promote partnerships with State and local governments, individuals, and public and private groups at all levels, as well as utilizing President Bush's thousand points of light. We want the varied voluntary and unique organizations within our Nation's communities to help us with our responsibilities.

ALASKA OIL SPILL

In addition, I would like to say a few words about the Prince William Sound oil spill. I visited the area 2 weeks ago, Mr. Chairman.

My feelings are that certainly we want the adverse effects of this tragic oil spill to be reversed as quickly as possible, and we want to learn from this experience. Each of us—the oil and gas industry, the Federal Government, State and local governments—must take all practical steps to help ensure that tragedies of this magnitude do not happen again.

BUDGET OVERVIEW

Let me speak to the Department of the Interior's budget. The overall budget is $7 billion, and within this amount there is an emphasis on maintaining current operations. Although specific details are not yet available, we support the April 14 bipartisan budget agreement between the President and the joint leadership of Congress, and we will be happy to give our overall support to appropriation bills consistent with this agreement.

The budget for the Department of the Interior was developed by former President Reagan's administration as you know, but has been revised by President Bush.

BUREAU OF RECLAMATION BUDGET REQUEST

The Bureau of Reclamation's 1990 budget is $978.9 million. The Bureau proposes establishing a reclamation operation and maintenance revolving fund, which creates a self-supporting fund with revenues from water and power users to pay for the reimbursable operation and maintenance work.

This proposal is consistent with the Bureau's new direction. The reclamation O&M revolving fund will permit the Bureau to address its O&M needs in a businesslike way, to operate more efficiently and more cost effectively, and to increase coordination between the Bureau and the power marketing administrations.

This proposal, of course, Mr. Chairman, as you know, requires legislative authorization.

The 1990 request for $11.6 million for general investigations also reflects the new direction of the Bureau of Reclamation. Most of these studies emphasize nonstructural solutions to water resource problems.

The construction program request is $644.3 million, continuing the previous Secretary's policy of completing projects substantially underway, and making project benefits available on the most efficient schedule possible.

Over half of the $644 million is for two projects: The Central Arizona Project and the Central Utah Project.

In summary, let me say I am delighted to be here today in my capacity as Secretary of the Interior, and I look forward to working with you and hope that I enjoy the same excellent relationship with this subcommittee that my predecessor had.

Now, Dale Duvall has some opening remarks, and then we will be happy to answer any of your questions, Mr. Chairman.

[The statement follows:]

STATEMENT OF MANUEL LUJAN

Mr. Chairman and Members of the Committee:

I am pleased to appear before you today in support of the President's FY 1990 budget for the Bureau of Reclamation, Department of the Interior.

In his Inaugural address, President Bush said that "not only is leadership passed from generation to generation, but so is stewardship." The President and I agree that the conservation and wise management of our natural resources will have a priority in his Administration. We are committed to protecting and enhancing the Nation's valuable resources, as well as proceeding with their environmentally sound development.

Before discussing the specifics of our 1990 budget request, I would like to discuss the devastating oil spill in Alaska's Prince William Sound which has affected all of us so deeply. Certainly, we want the adverse effects of this tragic oil spill in Prince William Sound to be reversed as quickly as possible and for this to be a learning experience so that each of us -- the oil and gas industry, the Federal Government, and State and local governments -- takes all practical steps to help ensure that tragedies of this magnitude do not happen again.

Our activities with respect to the oil spill in Prince William Sound flow both from our responsibilities under existing Federal environmental laws -- the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) and the Clean Water Act -- to provide response assistance to the Coast Guard and from our own broad authorities to protect all natural resources under Interior's jurisdiction affected by the spill, including the area's National Parks and National Wildlife Refuges. The Department also has authority to conduct an assessment of the natural resource damage resulting from the spill. As you know, because the Exxon Valdez incident occurred in coastal waters, the Coast Guard has the lead on response oversight and has complete responsibility for on-scene actions to assess, prevent, contain, assure clean-up of, or otherwise mitigate the effects of the spill. This authority includes the ability to access the revolving fund established to reimburse the Federal costs of clean-up actions under authority of Section 311(k) of the Clean Water Act and the National Contingency Plan.

We have been actively and directly involved with the Coast Guard and other Federal and state agencies organized through the Alaska Regional Response Team in terms of our on-scene response to the spill itself. Let me briefly describe the work we have undertaken.

When the tanker Exxon Valdez struck a reef 30 miles outside the Port of Valdez, Alaska, the immediate concern was for the land and wildlife of Prince William Sound. The Fish and Wildlife Service (FWS) began working almost immediately to aid in the rehabilitation of living oiled birds and mammals, whenever practical. The Service has been overseeing private contractors hired by Exxon in the establishment of bird and otter cleaning and rehabilitation facilities.

The Service is also conducting shoreline surveys in the Prince William Sound spill area as counts of dead or moribund birds, otters, and other marine mammals on beaches provide a measure of the spill's direct impact. Similar systematic surveys are also being conducted by air and at sea in all areas where the oil spill has spread. In this way, the FWS can determine the impact on marine and coastal birds and mammals.

When the spill response entered its fifth day, it became clear that the oil would not be contained in the Sound and that, after entering the currents of the Gulf of Alaska, it could come aground in Kenai Fjords National Park.

In response to this threat, the National Park Service (NPS) called in an Incident Command Overhead Team on March 29 to assist the regional staff and park staff of six. Teams of biologists did quick intelligence gathering to locate concentrations of marine mammals and birds, and to assess methods of protection. The command team, working with the City of Seward, Kenai Peninsula Borough, fishermen, and the State of Alaska, set priorities for protecting important fish and wildlife habitat. Subsequently, the Coast Guard directed boom deployment and other operations. Local fishermen were instrumental in deploying oil contaminant booms obtained by the City of Seward. Branch operations were established in Kenai and Homer; these branches are supporting the NPS response efforts for Katmai and Lake Clark National Parks.

In addition to these actions, I have negotiated, in cooperation with the other Natural Resource Trustees established under authority of CERCLA and the Clean Water Act (the State of Alaska, the Departments of Agriculture and Commerce), an initial up-front $15 million payment from Exxon to begin damage assessment activities to determine both the short and long-term effects of the spill on our park, wildlife, and other natural resources, in order to establish the mitigation steps and compensation that will be necessary to return these areas as best as is humanly possible to their pre-spill condition. With respect to funding for our activities related to the spill, existing law places most of the burden for these expenses clearly on the shoulders of the responsible party. We will be doing all in our power to ensure that such costs are appropriately collected from Exxon.

As a member of the National Response Team, the Department has been actively reviewing, along with EPA and other Federal agencies, the adequacy of industry, Federal, or State contingency plans implemented at the time of the incident in Alaska. The National Response Team was asked by the President to prepare for him a 30-day report to indicate the immediate lessons learned from the Alaska spill and to prepare a more detailed, analytical report on the overall adequacy of oil spill contingency planning to be presented to the President within six months. In addition, within the Department, I have directed the Minerals Management Service (MMS) to increase its research on oil spill contaminant and clean-up technology and to share the costs of such studies with industry. Finally, I have directed MMS to initiate more unannounced inspections of offshore oil drilling platforms to insure that we maintain a heightened state of readiness to prevent and, if necessary, respond to emergencies.

Overall Goals

With respect to our principal goal of stewardship, the President and I have jointly agreed to an expanded ten-point agenda for the Department of the Interior. The word "stewardship" naturally expands into an acronym for outlining these ten points: **S**tewardship; **T**erritories; **E**ducation; **W**ar on Drugs; **A**merica the Beautiful; **R**esponsible, Efficient and Ethical Management; **D**omestic Resources; **S**cience and Technology; **H**armony; **I**ndian Tribes and Alaska Native Groups; and, **P**artnerships. Let me expand upon this theme for my direction of the Department of the Interior and its employees:

STEWARDSHIP: We will be good stewards, conserving and wisely managing our national resources of limitless beauty and value.

TERRITORIES: We will work with the leadership of the Territories and Freely Associated States to further the political, economic, and social development of their peoples.

EDUCATION: We will place a high priority on the important role of education in ensuring the public's knowledge, appreciation and support of our natural resource policies. We will use Departmental resources to help develop the Administration's long-range plan to reform, rejuvenate, and revitalize our education system for the benefit of all Americans.

WAR ON DRUGS: We will be aggressive soldiers in the Nation's war on drugs. We will take appropriate measures to: (1) increase cooperative efforts with State and local law enforcement officials to eradicate illegal crops and to interdict the sale and transportation of drugs on public lands; (2) provide a drug-free workplace, and (3) encourage treatment for drug-users.

AMERICA THE BEAUTIFUL: We will implement President Bush's "America the Beautiful" concept to strengthen and preserve our National Parks, National Wildlife Areas and Wilderness Areas.

RESPONSIBLE, EFFICIENT AND ETHICAL MANAGEMENT: We will manage the Department in a fiscally responsible, efficient and ethical manner, with a high priority placed on equal opportunity.

DOMESTIC RESOURCES: We will manage the multiple-use Federal lands and waters to provide the widest range of benefits from these domestic resources to the American people, including preservation, recreation, energy, minerals, water supply, food and fiber.

SCIENCE AND TECHNOLOGY: We will aggressively apply the ~~Department's~~ Department unique scientific and technological resources to the solution of national and international problems such as water and air quality, global climate change, acid rain, and biodiversity.

HARMONY: We will strive to bring a spirit of harmony to our public policy discussions through consultation, cooperation and coordination instead of confrontation among competing interests, consistent with President Bush's call for a "kinder, gentler Nation."

INDIAN TRIBES AND ALASKA NATIVE GROUPS: We are committed to making the ideals of Native American self-government and self-determination a reality. We will work with Native Americans to promote economic development, improved educational opportunities, and other measures to enhance their quality of life.

PARTNERSHIPS: We will promote partnerships with State and local governments, individuals, and public and private groups at all levels, as well as utilize President Bush's "thousand points of light" -- the varied, voluntary, and unique organizations within our Nation of communities.

With respect to our stewardship agenda, I want to highlight three specific areas:

The first concerns education, which I believe has an important role to play in assuring the public's knowledge, appreciation, and support of our natural resource policies. On a personal note, I take a deep interest in the education of young people, and I will personally work with others to develop a long-range plan to reform, rejuvenate, and revitalize our educational system. For example, in March, the Secretary of Education and I visited several Bureau of Indian Affairs (BIA) schools to learn first-hand about them. This trip reflects our commitment to improving education for Native Americans. We met with BIA officials, school administrators, teachers, parents, and children in an attempt to identify the needs of schools and the successful programs which might be duplicated throughout the BIA educational system.

One illustration of how the BIA is working to improve education is the Effective Schools program which is being implemented in 19 schools in school year 1988-89. These schools have received training to implement the program and are developing school improvement plans to increase student achievement. The program will include other schools in school year 1989-90.

In addition, there are many other areas where the Department is working actively in the area of education. For example, at the National Park Service's Gateway National Recreation Area, 26 acres of open beach, marshland, fresh-water ponds, and uplands provide an outdoor classroom for teachers and students of all ages and backgrounds. Programs include two special programs. The Ecology Village is the only tent and camping program in New York City where students learn about the marine ecosystem. The Sandy Hook Discovery Program is a 2 1/2 day residential experience targeted for urban youth in grades 4-6 to explore the marine and historic environment of Sandy Hook. Similarly, the San Francisco Bay National Wildlife Refuge Environmental Education Center of the Fish and Wildlife Service is a place to learn about the Bay environment through hands-on activities. Students of all ages have an opportunity to study a variety of topics, such as plants, wildlife and their habitats, marsh ecology, and environmental conservation.

I also intend to place a strong emphasis on volunteerism. The Department now benefits from an increasing number of volunteers who work in parks, refuges, and hatcheries, and on public lands. In 1988, there were over 70 thousand volunteers who contributed nearly 3.5 million hours of their time. They picked up litter, cleared brush from trails, provided information on parks, conducted bird surveys, did archaeological research, and helped out in a variety of other ways. Their work was estimated to be valued at more than $28 million in 1988 at very little cost to the taxpayer.

The Bureau of Reclamation plans to expand its volunteer programs. For example, the Bureau has initiated a program at Yellowtail Dam, where it accepts the volunteer services of students and provides training for them as Hydropower Plant Operators, Plant Mechanics, and Electricians. Current participants are grantees of BIA who are enrolled in an apprenticeship program with a local college. Reclamation is working with Regis College in Denver to initiate a program to accept volunteer services from students in administrative degree programs while the students gain work experience for credit.

I have directed Assistant Secretaries and Bureau and Office Directors to increase or, in some cases, to establish volunteer programs in their agencies and we have drafted legislation to expand the acceptance of volunteer services within the Department. If Reclamation received authorization to accept volunteer services from other than students, various options would be explored. One such project would be accepting the services of volunteer tour guides at Hoover Dam. The "Thirty-oners," an organization of people who worked building Hoover Dam during the 1930's, are interested in working with Reclamation on a unique tour guide program at the dam in which members would give first-hand accounts of the building process.

In addition to volunteerism, the Department has and will continue to place a high priority on strengthening drug enforcement and eradication efforts on public lands.

1990 Interior Department Budget

The 1990 Interior Department budget was developed by former President Reagan and has been revised by President Bush. The revisions proposed by President Bush will provide additional funding for new Federal land acquisition by three Interior bureaus -- the National Park Service, the Fish and Wildlife Service, and the Bureau of Land Management -- as well as by the U.S. Forest Service in the Department of Agriculture; remove funding caps for the Federal Aid in Wildlife and Sport Fish Restoration programs of the Fish and Wildlife Service; and postpone or delay three OCS lease sales.

Although specific details are not yet available, we support the April 14 bipartisan budget agreement between the President and the joint leadership of Congress, and we will be happy to give our overall support to appropriations bills consistent with that agreement.

The 1990 budget request of $7.0 billion for the Department of the Interior meets the multiple operating responsibilities of the Department. A total of $5.4 billion is included for funds subject to annual appropriations by the Interior and Energy and Water Subcommittees, a decrease of $191.1 million below the 1989 enacted level, but an increase of $455.2 million above the 1989 President's request. These figures include changes made to the budget by the President in his February 9, 1989 address to Congress.

Bureau of Reclamation

The overall 1990 budget request for the Bureau is $975.2 million, a decrease of $125.2 million compared to the 1989 estimate of $1.1 billion. For current appropriations under current law, the President's request is $978.9 million compared to the $993.6 million level in 1989. The 1990 budget request reflects a proposed legislative change to the Operation and Maintenance program. This legislative proposal, if enacted, would have the effect of reducing the current appropriations requested by the Bureau by $98.2 million, for a revised total of $880.7 million. No changes were made to the Bureau's budget in the President's February 9, 1989 address to Congress.

The 1990 funding request for the Operation and Maintenance (O&M) program under current law is $232.3 million, an increase of $44.6 million over the 1989 enacted level of $187.7 million, for activities on 37 Reclamation projects, as well as associated water resources management activities. This increase is evidence of the high priority we place on O&M and will allow Reclamation to continue to reduce the backlog of maintenance work under the multi-year effort initiated in 1989 to improve the operational efficiency and management of existing facilities.

A legislative proposal included in the 1990 request establishes a Reclamation Operation and Maintenance (O&M) Revolving Fund under which certain water and power revenues would be available for defraying the reimbursable operation, maintenance, and replacement (OM&R) costs of project facilities without annual appropriation. This legislation is currently under review within the Executive Branch.

The objective of the proposed Revolving Fund is to move the reimbursable Reclamation OM&R programs to a more direct, user-financed basis. An O&M Revolving Fund would give Reclamation the flexibility to manage the OM&R program more effectively. The OM&R work would be performed at a time when it is most cost-effective, which would result in optimization of water and power benefits and revenues from Reclamation projects. The nonreimbursable portion of OM&R expenses would continue to be funded by annual appropriations in the Energy and Water bill.

If the O&M Revolving Fund proposal were enacted, the 1990 request of $232.3 million for the Operation and Maintenance program would be reduced to $94.1 million for nonreimbursable work (e.g., work related primarily to fish and wildlife, recreation activities, associated O&M activities and flood control). In addition, a one time $40 million appropriation to capitalize the Revolving Fund would be necessary and $138.2 million of revenues for reimbursable work would be financed through the Revolving Fund.

The request for General Investigations (GI) is $11.6 million, a decrease of $2.7 million below the 1989 appropriation of $14.3 million. GI funds are used to finance studies of more effective ways to utilize water, related energy, and land resources of the West. In line with Reclamation's new direction, most of the planning studies emphasize nonstructural, management, and conservation solutions to meet identified water needs and problems. The 1990 request will fund 22 ongoing plan formulation studies, 2 ongoing advance planning projects, and 6 new studies - 5 plan formulation, and 1 advance planning.

The 1990 request for the Construction Program is $644.3 million, $68.0 million below the 1989 appropriation. This request provides for construction funding for 25 major multipurpose projects plus a large number of existing projects requiring rehabilitation and betterment, minor construction, and safety of dams work.

The construction program continues the policy initiated in 1988 by the previous Administration to complete projects substantially underway in order to begin repayment and to make the project benefits available on efficient construction schedules within available funds. Major projects budgeted in 1990 include the Central Arizona Project (CAP) at $218.6 million (including $13.8 million from the Safety of Dams Program), the Bonneville Unit of the Central Utah Project at $135.3 million, the Dolores project at $41.1 million, the Central Valley Project at $36.1 million, and the Safety of Dams Program at $29.3 million (excluding funds provided by this program for dam safety work on CAP). No funding is requested to continue construction of the Garrison Diversion Unit or the Davis Creek Dam segment of the North Loup Division.

The request for the Loan Program in 1990 is $33.3 million, an increase of $7.3 million over the 1989 enacted level of $26.0 million. This program authorizes the Bureau of Reclamation to make loans for construction, rehabilitation, and improvement of small non-Federal projects. The Federal government is involved in this program because the size and complexity of most projects are beyond the financial resources of local entities. The proposed funding level for 1990 will enable the ongoing Loan Program to meet scheduled commitments on five loans, four of which will be completed in 1990.

The 1990 request for the Bureau's Working Capital Fund is $8.5 million, an increase of $4.5 million over the 1989 appropriation. This includes $7.1 million of second-year funding for essential computer capacity to support an important Department-wide initiative to modernize payroll/personnel and accounting systems. This project will result in long-term cost savings in all of the Department's bureaus through the use of common Department-wide systems for payroll and administrative accounting. All users (Interior bureaus and other agencies) will repay the costs of the computer acquisition through annual operating charges.

The 1990 request for General Administrative Expenses (GAE) is $48.0 million, a decrease of $0.3 million from the 1989 appropriation. This request reflects the complete implementation of the Bureau's reorganization. The reorganization reduced the personnel level in the office of the Commissioner in Washington; expanded the Bureau's office in Denver, Colorado; and reduced the number of regions from six to five. Without the reorganization, it is estimated that the Bureau's GAE costs for 1990 would have been $54.0 million, thereby resulting in a $6.0 million savings.

The request for the Emergency Fund is $1.0 million, the same as the 1989 level.

Conclusion

In conclusion, Mr. Chairman, the FY 1990 Bureau of Reclamation budget recognizes that Federal resources are limited, that the Reclamation Operation and Maintenance program is essential to meeting water and power needs, and that those construction projects already underway and substantially complete must be given priority.

As you know I am not unfamiliar with the legislative process. I must say I am certainly looking forward to the experience of working with the Congress from my new perspective as Secretary of the Interior, and I am particularly looking forward to working with this Subcommittee.

Thank you for the opportunity to appear before you today. I will be happy to answer any questions you have at this time.

STATEMENT OF C. DALE DUVALL, COMMISSIONER, BUREAU OF RECLAMATION

Mr. DUVALL. Thank you, Mr. Secretary.

Mr. Chairman and members of the committee, it is a pleasure for me to be here today to discuss the Bureau of Reclamation's fiscal year 1990 budget request of $880.7 million for current appropriations, which is presented in full recognition of the Federal deficit and the constraints needed over these next few years.

OPERATION AND MAINTENANCE PROGRAMS

To achieve this overriding objective we have had to face some very difficult choices in our program priorities. To us, our Operation and Maintenance Program is our most important program. That is why we are proposing a $232.3 million program. That represents an increase of $44.6 million over the 1989 level. We believe that is needed. We believe it is needed because we must continue to eliminate the accumulated backlog of identified and essential maintenance that has been deferred due to previous years' budgetary constraints.

It is needed to assure dependable, reliable delivery of water and power to the western portion of this Nation. It is also needed to assure that the anticipated project revenues continue to flow back to the U.S. Treasury.

As a separate, but very much related initiative, that also reflects our commitment to an effective program of orderly maintenance, we are proposing legislation which will seek to authorize a reclamation operation and maintenance revolving fund. Authorizing legislation has been jointly developed with the cooperation of the power marketing administrations. It is now moving through the administration's review process, and we intend to submit it soon.

The revolving fund will provide the needed financial certainty for an efficient, businesslike operation, maintenance, and repair program; a program that will assure the dependability of water and power systems to sustain the economic and environmental stability of the West.

I should note that our commitment to fulfill the growing water needs of the West, without proposing construction of major new projects, is almost entirely contingent upon not only maintaining, but also upgrading existing facilities.

GENERAL INVESTIGATIONS PROGRAM

In the area of general investigations, which are planning studies, our request is for $11.6 million. That is $2.7 million less than in 1989. The entire request is in support of the new resources management direction of the Bureau.

Proposed studies address water and power efficiencies, rather than costly construction. Six new studies are proposed. The entire program, all 30 studies, emphasizes conservation, management efficiency, and resolution of water problems in less capital intensive ways.

Cost sharing at 50 percent is still an essential requirement of this program.

WORKING CAPITAL FUND

I believe the Secretary covered the construction program adequately. I would note, then, that the request for $8.5 million for the working capital fund is essential to continue Departmentwide initiatives that will yield long-term cost savings even beyond the Department of the Interior.

CONCLUSION

Mr. Chairman and committee members, I think that identifies the priority of this budget request. This budget supports the redirection of the Bureau by focusing on studies and projects to meet the water resources needs of the Nation, while reducing dependency on new and costly infrastructure.

In order to do this and still deliver a sufficient water supply, it is essential that the program of operation and maintenance of project facilities be sustained at the proposed efficient level.

Also, I want to assure you that we are working aggressively on the revolving fund legislation so it can be considered by the Congress in the near future.

Thank you.

[The statement follows:]

STATEMENT OF C. DALE DUVALL

Thank you, Mr. Chairman, for the opportunity to appear before you and the Committee today to discuss the proposed fiscal year 1990 budget for the Bureau of Reclamation.

The Bureau is requesting $880.7 million of current authority which is a decrease of $112.9 million from the $993.6 million appropriated in fiscal year 1989. A proposed legislative change to the Operation and Maintenance program accounts for $98.2 million of the reduction. Under this proposal, the change in overall program activity from 1989 to 1990 is a reduction of only $14.7 million, not the $112.9 million mentioned above.

This budget request affirms the Administration's commitment to water resources development and supports the redirection of the Bureau which focuses on water resources management rather than water project construction. The focus on water management includes improvement in the efficiency of existing systems, non-structural solutions to water resource problems, and water quality and related environmental issues. The fiscal year 1990 budget request continues our strong commitment to the operation and maintenance of our facilities with the increased program planned to reduce the backlog of maintenance items. To assist in this effort, a legislative initiative is proposed to establish a Reclamation Operation and Maintenance Revolving Fund.

The fiscal year 1990 budget request also continues the policy of concentrating construction funds on projects nearing completion and affirms the President's commitment to reduce the budget deficit. In order to comply with Administration efforts to constrain outyear spending, no new construction or loan projects are proposed.

The Bureau's reorganization plan presented in 1987 and addressed in the 1989 Energy and Water Development Appropriations Act has been fully implemented. It has reduced the personnel level in the Washington office; concentrated certain policy and technical functions in the Denver office; and reduced the number of regions by one to a total of five. The request for fiscal year 1990 reflects the first year of the completed reorganization and a savings of $6.0 million in the General Administrative Expenses account.

Operation and Maintenance -- $232,287,000

Proper operation and maintenance of completed project facilities is the highest priority for Reclamation. This is an essential function to assure meeting contractual commitments for delivery of project benefits as well as the timely recovery of reimbursable costs. The FY 1990 O&M program is $44.6 million over the 1989 level. An initiative to eliminate the accumulated deferred maintenance backlog started in FY 1989. Approximately $25 million of the increase is required to continue backlog maintenance items commenced in FY 1989. The balance of $19.6 million will be used to start additional backlog work items and perform other needed maintenance before critical situations develop. I assure you that our efforts to date on the initiative to eliminate the backlog of work have been very positive. The FY 1990 appropriation request and the legislative proposal to establish a revolving fund are essential to continuing that positive trend.

We are proposing legislation to establish a Reclamation Operation and Maintenance Revolving Fund for financing the reimbursable portion of operation, maintenance, and replacement (OM&R) costs of water projects. The establishment of the Revolving Fund will allow Reclamation to perform effective and timely OM&R activities and ensure meeting contract commitments for water and power delivery. Also, implementing the Revolving Fund will increase communication and project coordination between Reclamation and the responsible user groups including the Power Marketing Administrations that market and transmit power generated at Reclamation projects. Under this legislation, the reimbursable OM&R work will be directly financed through the use of a revolving fund, by revenues from the project beneficiaries. Non-reimbursable OM&R work would continue to be financed by annual appropriations from the Reclamation Fund.

For fiscal year 1990, this legislative proposal for a revolving fund would result in $138,201,000 of reimbursable OM&R work being financed in the Revolving Fund and $94,086,000 of non-reimbursable OM&R work being financed by annual appropriations. In addition, we are requesting a one-time appropriation of $40,000,000 which is required to initiate implementation of the Revolving Fund. These amounts are in addition to the funding that currently is available from existing revolving funds, the Lower Colorado River Basin Development Fund and the Upper Colorado River Basin Fund and the permanent appropriation, Colorado River Dam Fund.

General Investigations -- $11,550,000

This request of $11,550,000 fully exemplifies and supports the new direction of the Bureau. It continues funding for the 24 ongoing studies from 1989 and initiates 6 new studies. All 30 of the investigations are studies seeking alternatives to solve water resource problems in less capital-intensive ways. The overall program is consistent with existing policy of encouraging non-Federal funding support. The new studies are cost shared at least 50 percent except for the study called Toxic Constituent Studies. In FY 1990 four studies will be completed.

The request for fiscal year 1990 is $2.7 million less than the comparable amount appropriated in fiscal year 1989.

Construction Program -- $644,307,000

In keeping with the Administration's policy announced in 1988 on the construction of water resources projects, this request will allow construction to continue on schedule for those projects substantially underway, and will bring some projects constrained earlier onto a more efficient schedule. However, funding will continue to be constrained on some projects or features where minimal or no investment has been made to date. Specifically, funding constraints have been made on the Garrison Diversion Unit and the Davis Creek component of the North Loup Division. Proposed funding for these ongoing projects is limited to bringing ongoing work to a reasonable conclusion and protecting the existing facilities.

The Central Arizona Project (CAP) continues to be the largest construction activity with a budget request of $218.6 million which includes $13.8 million for safety of dams work on Roosevelt Dam. The plan 6 features of the CAP have been updated to reflect the deletion of Cliff Dam and additional safety of dams program activities for Horseshoe and Bartlett dams. Major construction activities will continue on the Tucson Aqueduct to deliver water to Tucson in 1991 and on the New Waddell and Modified Roosevelt dams. Water will be delivered to three additional non-Indian irrigation districts by the end of 1990. Local entities will have contributed upfront funding of about $119 million through 1990.

In addition to the $13.8 million for Roosevelt Dam, we are requesting $29.3 million for other safety of dams work. This includes initiation of corrective action on 7 dams and continuation or completion of work on 13 dams. The priority for dam safety corrective action remains high even though the funding level is declining. This decline is due to completion of major activities at Jackson Lake Dam and Fontenelle Dam and work nearing completion at Stewart Mountain Dam. Reclamation continues to provide cost-reimbursed engineering assistance to other Interior bureaus in all phases of their dam safety programs.

We are requesting $135.3 million for the Bonneville Unit of the Central Utah Project. These funds will be used for work on relocating Highways 40 and 189, land acquisition and construction of Stage II, all part of the Jordanelle Dam and Reservoir; work on the Syar Tunnel of the Diamond Fork Power System; and recreation, fish and wildlife work.

Included in the Central Valley Project request of $36.1 million are funds for the San Luis Unit to continue studies of long term solutions to the flooding problems at Arroyo Pasajero and cleanup activities of Kesterson Reservoir. The Bureau is requesting funds to install a device to control the temperature of water releases from Shasta Reservoir and to continue cost-sharing payments to the State of California for Suisun Marsh protection facilities. The Trinity River Restoration Program work will continue the Trinity River Fish and Wildlife Management Program activities and construction of the Grass Valley Creek Debris Dam will be completed. Construction will continue on the modifications to the Tehama-Colusa Canal.

Loan Program -- $33,292,000

The Loan Program requires $33,292,000 in fiscal year 1990. This program authorizes Reclamation to make loans for the construction, rehabilitation, and betterment of water development projects. The amount requested will allow work to continue on five ongoing loans, four of which will be completed in FY 1990. No new loans are proposed.

General Administrative Expenses -- $47,983,000

The $48 million request will finance Reclamation's management responsibilities, which by law are designated as nonreimbursable. The amount requested reflects a $6 million savings in this account resulting from the completed reorganization of the Bureau.

Working Capital Fund -- $8,500,000

The request includes $7.1 million for second year funding of the computer equipment for the Business Systems Acquisition project, a departmental initiative; $1 million for replacements and additions to regional minicomputers; and $400,000 for acquisition of equipment. Development of the Business Systems Acquisition project is essential for the Department to implement several productivity improvement plans that are dependent upon improved availability of data.

Conclusion

In conclusion, I believe this budget supports the new direction of the Bureau and represents a balanced program by making the best use of available resources with appropriate consideration of fiscal constraints.

Thank you for your consideration of this request. This concludes my presentation and I would be pleased to answer any questions you may have at this time.

WEST DELTA FIELD, LA, DRAINAGE

Senator JOHNSTON. Thank you very much.

Secretary Lujan, on April 7, I wrote you about a problem we are having down in Louisiana with respect to Federal/State reservoirs and drainage. As you will recall, last year's law required that a fact-finder be appointed to determine the truth of the matter, the amount of drainage going on.

That fact-finder issued a report, which said that there has been drainage, that the State has lost $8 million as a result of that drainage, and that the State's lessees have lost $15.5 million as a result of that drainage. That is in one field, that is the West Delta Field.

The total Federal net drainage in six fields analyzed by the fact-finder along the Federal/State boundary has cost the State $10 million and the State's lessees $16.5 million.

Now, the Department of the Interior has refused to unitize the West Delta Field common reservoirs. I still have not received an answer from you on that. Can you give me a yea or nay?

Secretary LUJAN. No; I cannot give you a yea or nay. After I discussed the drainage issue with you on our trip to Louisiana, I quickly went on over to MMS upon my return to see how we are going to resolve the issue. MMS has not given me a definite answer to that except to say that the 8(g) moneys, the 27 percent in the 3- to 12-mile limit, which is the Federal part of the land, that 27 percent was what was intended to reimburse the State for that drainage.

I did not like that answer particularly.

Senator JOHNSTON. Well, that is what they have been saying all along.

I might say this, that we need a yea or nay answer. That was the reason for the appointment of the fact-finder. The law required it. The fact-finder went in dispassionately, found the facts, found the amount of the drainage. I would hope that that fact-finder's report could be accepted.

If it cannot, then I would hope at least that we can get a yea or nay answer. I mean, we know how to negotiate, we know how to be an adversary. We think we can move with despatch as an adversary. We hope we do not have to do that with the Secretary of the Interior. That is the purpose of appointing the fact-finder.

But after the expiration of a period of time, and I would think 1 month ought to be more than sufficient, that we get a yes or a no answer. Because we are going to go into the adversary mode here right quick.

Secretary LUJAN. I will get that answer for you, Senator.

TENNIS CENTER PROBLEMS

Senator JOHNSTON. All right.

Now, second, with respect to the tennis center. It has been an interest of mine and of many, many people in this town. They need to put that tennis center under contract. I think they are really being badly jerked around by the lessee. What do you call them, the concessionaire? I think you really ought to look into the situation. It appears they are committing what looks to me like highway robbery.

Do you know that they would charge the tennis patrons, a nonprofit group, when they sell drinks, they charge them $90 a bottle for liquor, for selling mixed drinks. They are trying to hold them up now and use their leverage through you, knowing that they have got to make the tournament next year, they are trying to hold that thing up.

Now, you are supposed to have an answer on that by Friday?

Secretary LUJAN. Well, I did. I called your office, Senator. They had a meeting over at the Park Service and resolved most of the issues. I do remember that business of $90 a bottle.

Senator JOHNSTON. I do not drink, but if I did——

Secretary LUJAN. Yes; it sounds terrible.

Senator JOHNSTON. None of my colleagues do either. [Laughter.]

Secretary LUJAN. Are you sure that is not a Federal offense?

Senator JOHNSTON. Is that high, $90 a bottle?

Secretary LUJAN That could be the overall price that people are charged. On May 5 they told me they were going to have their final meeting and they told me that the issue would be resolved by tomorrow. I called your office and left word for you.

Senator JOHNSTON. I got that answer. That is on track and will be decided.

Secretary LUJAN. By tomorrow. Tomorrow is May 5.

Senator JOHNSTON. Well, I hope we will have that under contract tomorrow.

Secretary LUJAN. Well, I do, too. I will make a particular note of it to say that tomorrow they ought to get it straightened out, one way or the other.

Senator JOHNSTON. I can tell you that will be a source of acute embarrassment to me and, I would think, to you, if that tournament does not go off on time, and they are pointing fingers at us and say, it is your fault. That tennis tournament is a very big thing with a lot of folks in town.

WETLANDS POLICY

Mr. Secretary, the President has said we are going to have a no net loss policy on wetlands. Is that possible?

Secretary LUJAN. I suppose if you count the wetlands that we saw in Louisiana on the coastland, if you are talking about that, it is probably almost impossible to have a no net loss with the amount of wetlands that we lose there.

The answer, of course, is to try to prevent it. I do not really know how to. As you know, we are doing the study that you sponsored. If we continue to lose wetlands at the present rate, it certainly is not going to be possible to have no net loss.

Senator JOHNSTON. Well, I think we are losing about 60 square miles a year in Louisiana. I do not think there is enough money in the world to stop all of that—$10 billion a year might do it. But it would take some huge number like that. Just imagine trying to fill in a square mile, and then figure you have got to do that 60 square miles every year. Or even levee that off, you could not do that.

Obviously more can be done than is being done now. Which Federal agency do you think it would be appropriate to take the lead on this? Now, we had the Corps of Engineers yesterday in here, and they stated, after some questioning, that they thought probably the Corps ought to be the lead agency on that.

Would you agree with that?

Secretary **Lujan**. The only real effective thing that I have heard, and there may be other effective things, is some dredging down the river; was it that one of the ways that they were keeping the flow going in a different direction?

Senator **Johnston**. Well, there are a whole series of things. There are fresh water diversion projects, where you pump water, as in the Canarvan and Bonnet Carre project. By the way, the administration is opposed to various features of these projects to restore coastal wetlands. Things can be done; there is fresh water diversion, there is leveeing, there is filling in the canals, pumping, there is a whole series of actions we can take, but they all cost money. The question still remains: Who should be the lead agency to do that?

Secretary **Lujan**. Well, you mentioned the Corps of Engineers, and they are one possibility. In our Department, the Fish and Wildlife Service is the Bureau that is responsible for wetlands.

WHITE HOUSE TASK FORCE ON WETLANDS

My understanding is that there is going to be a White House conference on this very issue—a task force on wetlands.

Senator **Johnston**. When is that going to be done?

Secretary **Lujan**. It has been proposed; it should be moving along shortly. The President has not announced the task force membership yet.

Senator **Johnston**. That is the President's response to his no net loss policy is to appoint a task force at some time in the future?

Secretary **Lujan**. Well, that is one response to one part of the problem. This certainly is a big problem, as I saw first hand when I went down to Louisiana with you. It is almost such an enormous task that one does not know where to begin. At first, as I told you, I thought we could just put some riprap, like they do on the side of a river or something, and that would save all the coastline. But this is a totally different type of problem. I had never dealt with this issue before and I was not very familiar with it. But certainly, the thing that I initially thought was the solution certainly was not the answer.

Senator **Johnston**. Senator Hatfield?

PREPARED QUESTIONS SUBMITTED BY SENATOR SPECTER

Senator **Hatfield**. Thank you, Mr. Chairman.

Mr. Chairman, I ask unanimous consent that four questions submitted by Senator Specter be made part of the record for response.

Senator **Johnston**. Yes, without objection those will be made part of the record.

Senator **Hatfield**. Thank you.

[The questions and answers follow:]

QUESTION SUBMITTED BY SENATOR ARLEN SPECTER

NATIONAL CONSTITUTION CENTER

Question. On September 16, 1988, President Reagan signed into law the "Constitution Heritage Act" (Public Law 100–433) which established the National Constitution Center in Philadelphia, Pennsylvania. This new law authorizes the Secretary of Interior to enter into a cooperative agreement regarding the creation and operation of this Center. Please provide a status report as to what actions the Department of Interior has taken to date regarding establishment of the National Constitution Center. How, and in what amount, does the Department of Interior plan to fund this project in fiscal year 1990? Also, please provide a timetable for additional actions which are necessary in establishing this Center and the Department's plans in this regard.

Answer. The Service issued an activation memorandum to the field on November 23, 1988, in order to institute provisions of the Constitution Heritage Act of 1988. A meeting was held in January 1989 between the Regional Director of the Mid-Atlantic Region of the National Park Service and representatives of the National Constitution Center as called for in the legislation. The committee has met and a draft agreement is being circulated for comments.

Since discussions concerning the National Constitution Center started after the deadline for submissions for the fiscal year 1990 budget, no funding request was made. Once a cooperative agreement is established, the National Park Service and the National Constitution Center can work together to draft future budget requests. A major part of this process will be the identification of a physical location for the center.

GETTYSBURG MUSEUM

Question. In 1988, the nation commemorated the 125th anniversary of the historic Battle of Gettysburg. In this regard, the Senate Appropriations Committee included language in its reports accompanying both the fiscal year 1988 and fiscal year 1989 Interior and Related Agencies Appropriations Bills supporting the Department's efforts in rehabilitating the Gettysburg Visitors' Center and transforming it into a world-class museum. Please provide a status report of the Department's initiatives in this project to date. What additional steps must be taken to complete the creation of the National Museum of the Civil War? What funding provisions in fiscal year 1990 has the Department made for this project?

Answer. Beginning in fiscal year 1983 and continuing through fiscal year 1989, a total of $777,000 has been made available for this project: $627,000 has been spent for exhibit construction and the acquisition and preservation of artifacts and $150,000 has been spent for preliminary architectural design of proposed building modifications and exhibit planning. In fiscal year 1988, the Service expended approximately $253,000 through the Harpers Ferry Center Major Exhibit Program and $146,000 collected through the fundraising campaign for this project. The Service was able to temporarily "showcase" the magnificent artifact collection during the celebration of the 125th Anniversary of the Battle of Gettysburg.

The schedule for completion of the Civil War Museum remains in doubt at this time, inasmuch as fundraising efforts have resulted in collection of $330,500 and the Service now estimates the cost of completing the museum project at $4.7 to $6.8 million. The current estimate, up from an earlier estimate of $1.5 million for building renovation and $750,000 for exhibit rehabilitation, includes costs of substantially renovating and upgrading the building and exhibits. The current estimate includes structural modification, improved access, and replacement of the heating system. The scope of work contemplated for the project has increased significantly since the time the initial estimate was prepared. Inasmuch as the available funding level for park improvements is necessarily limited and the National Park Service has identified many higher priority construction projects that involve health and safety considerations and the rehabilitation of existing facilities, tentative dates for full funding or completion of this project cannot be given at this time.

GETTYSBURG HISTORIC PATHWAY

Question. The Borough of Gettysburg is planning a project that is of great significance in preserving part of our nation's history. The concept of a "Gettysburg Historic Pathway" involves the redesign and improvement of a street corridor that is rich in history, containing many Civil War era buildings and sites. This corridor links the National Cemetery where President Lincoln delivered the Gettysburg Address to the train station where he arrived and the house where he stayed during his historic visit. Considering the vital role of the National Park Service in supporting the Gettysburg National Military Park, what plans does the Department have to support the Gettysburg Historic Pathway project? What funding may be made available in fiscal year 1990?

Answer. The 1988 Boundary study for Gettysburg National Military Park, as required by Public Law 100-132, identified the need for the National Park Service to cooperate with and provide assistance to local governments, organizations and citizens for the conservation of historic values of the Gettysburg area. The proposed "Gettysburg Historic Pathway" project would clearly promote conservation of historic resources in the Borough of Gettysburg associated with the Civil War, Lincoln's Gettysburg Address and President Dwight Eisenhower. The National Park Service is willing to participate in this cooperative project, but has not included any request for technical assistance findings in its fiscal year 1990 budget request due to higher priority concerns.

NATIONAL HERITAGE CORRIDOR

Question. On November 18, 1988, the President signed into law the "Delaware and Lehigh Navigation Canal National Heritage Corridor Act" (Public Law 100-692) establishing a Federal commission to assist in planning and implementing an integrated strategy for protecting and promoting cultural, historical and natural resources in the region. The establishment of the National Heritage Corridor will focus national attention on this area and help stimulate responsible redevelopment of the resources in the region. What plans does the Department have for funding this project in fiscal year 1990?

Answer. There are no funds available for National Park Service implementation in fiscal year 1990. Although Congress established the Delaware and Lehigh Navigation Canal National Heritage Corridor in 1988, it did not appropriate any funds to carry out the provisions of the act. The National Park Service anticipates a request by the Commission, which is to be established under section 5 of the act, to assist in the preparation of a Cultural Heritage and Corridor Management Plan. The cost for this National Park Service assistance in fiscal year 1990 is estimated at $185,000.

DEVELOPMENT OF NATIONAL WATER POLICY

Senator HATFIELD. I would like to welcome the Secretary, Commissioner Duvall, and your associates here today. It is always a pleasure to have you testify before our committee.

Coming from a Western State, I am especially cognizant of the importance that water has to all facets of our lives, energy, recreation, irrigation, and industry. But no longer, Mr. Secretary, do I see this as purely a western problem.

Over the last few months I have had the opportunity to address a number of national water associations and conferences. Practically unanimous response has been in agreement to my observations made at those meetings that in the next decade or two we will be facing a crisis far greater than the one we faced with oil a few years ago, as it relates to water, when it will become very scarce; it will become very expensive.

I am sure it will be a source of conflict, even leading, perhaps, to violence. There are pockets of those trends already in this country.

I do not need to lecture to you, the experts, but I only want to express this, again, my personal concern and interest in developing a national water policy, one which encompasses all of the Federal agencies dealing with this precious commodity, and touches all facets of that resource: Conservation, water quality, storage, and distribution.

I am in the process of preparing comprehensive legislation establishing a national water commission to achieve these goals. I, like the chairman, who has expressed his frustration, over these 2 days of testimony, about a lack of a national policy on wetlands, I really feel that we have to have a far more coordinated national policy than there has demonstrated interest from some agencies and from the past administrations.

That is one observation.

SUPREME COURT DECISION REGARDING FEDERAL EIS

Mr. Secretary, I have a second observation. And that is, I hope it has come to your attention of a very significant ruling by the Supreme Court on Monday of this week, reversing the 9th Circuit Court of Appeals, with an opinion written by Justice Stevens of the Supreme Court and with the unanimous endorsement of his colleagues on the court.

There were two basic things that occurred in this ruling. First of all, it overturned a ruling by the 9th Circuit as it relates to a project by the Corps of Engineers in my State of Oregon known as the Elk Creek Lake project. It also overturned several Forest Service timber sales more involved in the State to the north of ours, in the State of Washington, that raised identical questions about the legal sufficiency of Federal agency EIS process.

Because of the enormous responsibility you have over natural resource policy in this country and the jurisdiction of the Interior Department, I am sure that it could possibly lead to a greater impact on your policies and your management programs, even more than on the Corps of Engineers and the Forest Service.

Specifically, the Supreme Court overturned the 9th Circuit, in which it said that a Federal EIS need not include a 100 percent mitigation plan. The 9th Circuit, they said, was simply erroneous on this requirement.

Second, that new environmental information, which became available to an agency, does not, in and of itself, trigger the need for a supplemental EIS, but rather it is simply a new fact, and that need be weighed, of course, by the agency in charge.

Now, this is precisely the legal handle by which radical environmental groups in my State have seen fit not to try to make certain that an environmental policy was being enforced, but rather to block the sale of timber or to block the project itself.

Finally, the Supreme Court said that ultimately it is the technical experts within the agencies who we have to rely on to make these difficult decisions, not the judicial appeals process.

Now, as you are very much aware, we are in lawsuits constantly as it relates to the BLM. Today, as we meet, as much as 50 percent of your BLM sales in my State are now presently blocked, for this current fiscal year, are blocked by court actions in my part of the country.

I apologize, Mr. Chairman, for carrying on this discourse, except to say I do hope, Mr. Secretary, that you will respond to the suggestion that I made yesterday to the Corps of Engineers. And that is, you put your legal counsel on it, if you have not already, the task of interpreting and applying the ruling of the court that I referred to on last Monday as it relates to those policies and those programs within your agency. Because I am convinced that they will have great impact both today and in the future.

I thank the chairman for his patience.

PREPARED QUESTIONS SUBMITTED BY SENATOR HATFIELD

Mr. Chairman, I would ask unanimous consent to include about 10 questions on the Umatilla Basin project in the record.

Senator JOHNSTON. Thank you very much, Senator Hatfield.

Senator DeConcini.

Without objection, those questions will be incorporated into the record.

[The questions and answers follow:]

QUESTIONS SUBMITTED BY SENATOR MARK O. HATFIELD

BUREAU OF RECLAMATION

Umatilla Basin Project

Question: Can the Umatilla Basin Project be developed in phases?

Answer: Yes. The project has excellent potential for phase development. A first phase would include facilities associated with the West Extension Irrigation District water exchange and some automated water monitoring and measuring devices. A small pumping facility (Cottonwood Bend) to help improve flow conditions below Westland Irrigation District diversions may also be an appropriate addition to the first phase.

Question: Would expeditious implementation of a first phase development be helpful in resolving the pressing water issues in the basin?

Answer: Yes. Salmon and steelhead are returning to the mouth of the Umatilla River in increasing numbers as a result of fish planting programs that have been implemented by the Confederated Tribes of the Umatilla Indian Reservation and the State of Oregon. Without adequate streamflow in the Umatilla River, these fish will be unable to migrate upstream beyond the river mouth. The first phase development would provide streamflows needed in the lower reaches of the river to encourage upstream migration. This would contribute towards restoration of the basin fishery and would ease tensions while planning continues on the larger part of the project.

Question: Would a delay in implementing the Umatilla Basin Project increase costs?

Answer: Construction costs would increase in accordance with inflationary factors applicable to this type of construction. Also, the obligation of Reclamation to continue to fund operation and maintenance costs associated with present temporary water supply facilities in the lower basin will add to the eventual cost of providing a reliable water exchange program. The greatest risk is that the private water supply facilities being used on a temporary basis would suffer a major mechanical failure and thereby place a substantial replacement cost burden on the Federal Government.

Question: Would construction of the first phase require that other phases be implemented?

Answer: The project is designed to provide an efficient and effective water exchange program benefitting over 50 miles of the Umatilla River. Streamflow enhancement in this full reach of the river would be needed for full restoration of the fishery. The first phase would primarily benefit the lower 3 miles of the river and provide some benefit to the reach of the river below the Westland Irrigation District diversion. The first phase, while falling considerably short of meeting project goals, still provides substantial benefits.

Question: Pacific Northwest electric power ratepayers, Confederated Tribes of the Umatilla Indian Reservation, and the State of Oregon are now making investments in the Umatilla Basin in the neighborhood of at least $21 million. What is the importance of the Bureau of Reclamation project to these efforts?

Answer: The groups have joined with the Federal Government to undertake a major fishery restoration program in the basin. They are now investing their dollars in fish passage, hatchery and other facilities. This is their "cost share" for the restoration program. Streamflow enhancement is the major ingredient in making the restoration program reach its full potential. The Reclamation project would provide those streamflow improvements.

Question: Given the present fiscal situation, are there sound economic reasons for proceeding with this project?

Answer: This project has a good benefit-cost ratio of 1.7 to 1 from the standpoint of national economic development as identified in the Planning Report - Final Environmental Statement which was filed with the Environmental Protection Agency on February 12, 1988. Net national economic development benefits resulting from increased harvest of salmon and steelhead would exceed costs by about $3 million annually. Unlike many proposals where there is a "waiting period" for benefits to be realized, these steamflow enhancement benefits can be achieved quickly because of restoration efforts already underway through front-end cost sharing efforts of local partners.

Question: What is your capability to begin construction in fiscal year 1990?

Answer: Funds of $1,300,000 could be used in fiscal year 1990. This would allow Reclamation to complete designs, acquire right-of-way and initiate construction on the project's first phase West Extension Irrigation District (WEID) water exchange facilities. Completion of predesign activities on the remainder of the project, design of hydromet facilities and initiation of streamflow monitoring activities could also be accomplished. This would enable the WEID water exchange to be in place as early as the fall of 1991.

The proposed Reagan budget for the Bureau of Reclamation was based on that Administration's support for the Bureau's new priorities--increased resources for the operation and maintenance of existing projects, and emphasis on the construction of projects that are substantially underway. In order to provide additional resources in these areas, it was necessary to reduce funding for some activities including those that are new or of lower priority. As a result, the Reagan budget did not include funding for the Umatilla Basin Project.

The Bush Administration did not propose any specific changes to the January 9th Budget for this item. As long as the overall level of funding for Reclamation appropriations is consistent with allocations pursuant to the Bipartisan Budget Agreement and resulting Budget Resolutions, we would have no objections to this increase from a budgetary standpoint.

Question: What is the status of those activities approved under a reprogramming approved by this Subcommittee last month to investigate interim alternatives as was required by the authorizing statute?

Answer: The majority of the funds have been committed to design activities of the West Extension Irrigation District water exchange facilities. Other funds are being used to facilitate the review of current Umatilla Project operations. The transfer is allowing for greater input from the involved irrigation districts and will permit development of a refined river operations model to identify impacts of potential conservation measures. The remaining funds are being committed to advance planning of other elements related to the first-phase, including the design of the monitoring program that will be needed to track effectiveness of the water exchange program.

Question: In anticipation of construction funds being provided by Congress in FY90, would you please provide a capability statement for further work in FY89 and identify for the Subcommittee funds available within the Department which can be reprogrammed for that purpose.

Answer: Present funding is adequate for continuing the preconstruction activities at a level which would allow construction to begin in fiscal year 1990 if construction funds were to be made available.

Bureau Office in Bend, Oregon

Question: Please provide the Subcommittee information about the recently announced plans to open a project construction and operations office in Bend, Oregon, including information about staff levels, payroll amounts, mission and activities, and a list of those pending and planned projects to be handled by this office.

Answer: The Bend construction office will be responsible for directing construction activities of assigned projects in the Pacific Northwest Region and assigned construction activities under Memorandum Agreements for other Interior Agencies, local, State, or other Federal Agencies. The office will also be responsible for liaison with the O&M projects and irrigation districts in Central and Western Oregon. The office is intended to serve projects throughout the region and in other states where the jobs are expected to be of short duration. Total staffing will depend on the number of activities underway at any one time. Peak staffing is expected to reach about 28 positions with an annual payroll of approximately $900,000. The pending and planned projects to be handled by this office include the following: safety of dam modifications at Ochoco, Arthur R. Bowman, Wickiup, and Fish Lake Dams in Oregon; safety of dams modifications at Deer Flat Dams in Idaho; Minidoka Dam spillway rehabilitation and Minidoka Powerplant rehabilitation in Idaho; needle valve replacement at Owyhee Dam in Oregon; construction supervision for modifications to Crab Orchard Dam in Illinois for the Fish and Wildlife Service; contract administration and construction supervision of modifications to Price Lake, Trout Lake and Bass Lake Dams in North Carolina for the National Park Service; possible hazardous waste removal in Oregon for the Environmental Protection Agency; possible construction management of Milltown Hill Dam for Douglas County, Oregon; and other miscellaneous technical work on Reclamation projects in Oregon.

Elk Creek Dam Supreme Court Case

Question: Please have your legal staff provide for the record an analysis of the recent Elk Creek dam and Methow Valley Forest Service Supreme Court cases with particular regard as to the implications these decisions have on the Department's fisheries, wildlife, minerals and timber management responsibilities, including the pending BLM timber lawsuits in Oregon.

Answer: On May 1, 1989, the U.S. Supreme Court handed down rulings in Robertson v. Methow Valley Citizens Council and Marsh v. Oregon Natural Resources Council, both of which involved analysis of the requirement for "worst case analysis" in environmental impact statements prepared in compliance with the National Environmental Policy Act (NEPA).

In these decisions, the Supreme Court ruled that the former requirement of a worst case analysis was based solely in the regulations of the Council on Environmental Quality (CEQ) and not in NEPA itself. Since CEQ has amended its regulations to eliminate the requirement for a worst case analysis, such analysis is no longer necessary.

Accordingly, any pending or future environmental impact statements prepared in Departmental decision making, concerning the resources over which this Department has stewardship need not contain a worst case analysis. The pending NEPA litigation involving BLM timber sales does not involve the worst case analysis issue and will therefore not be affected by these decisions. In general, the Methow Valley and Marsh decisions should make future decisions less susceptible to successful legal challenge.

COOLIDGE DAM, AZ

Senator **DeConcini**. Mr. Chairman, thank you very much. I want to thank the Senator from Idaho and also the Senator from South Dakota—North Dakota—I just lost my place.

Senator **Johnston**. I would say to the Senator from Arizona, he has been doing so well without asking questions. [Laughter.]

Senator **DeConcini**. Thank you, Mr. Chairman. I will take that very seriously, Mr. Chairman, and I submit all of my questions. [Laughter.]

Mr. Secretary, welcome. Commissioner Duvall.

Let me ask you, first, about Coolidge Dam. Interior Department documents indicate the Coolidge Dam in Arizona poses a real and immediate hazard to persons and property living downstream from this structure. For the past 4 years we have funded safety-of-dam studies for Coolidge Dam, can you give us the status of this, Mr. Secretary? When do we expect to see a report on the condition of the dam, and when are we going to resolve who in the world is going to fix it, the Bureau or the BIA?

Secretary **Lujan**. Well, it is going to be both. I have some good news for you. Just today, we authorized $1.9 million; $500,000 from the BIA for 1989 and the other $1.4 million from the Bureau of Reclamation in 1990 to begin those studies. So we are on our way.

Senator **DeConcini**. Mr. Secretary, you know how to make a guy's day. Thank you. I have been working 4 years, and thank you, Mr. Duvall and Mr. Secretary. It is very important to us out there. I am deeply concerned, as you probably have become aware yourself, if you looked at it, that this could be a disaster.

Do you have any idea when they will get to the construction work, Mr. Duvall, or somebody?

Mr. **Frederick**. It looks like it is going to be somewhere on the order of 15 to 18 months; early 1991.

Senator **DeConcini**. Early 1991?

Mr. **Frederick**. In early 1991. The money that Mr. Lujan was referring is all preconstruction studies and analysis, and they will start that immediately.

Senator **DeConcini**. Is it safe to conclude, then, that after this study, and plans are put together, assuming that you concur with what has been said in the past by the Department, that construction would be budgeted for 1991 then; construction money? Is that a safe assumption?

Mr. **Frederick**. The construction issue will be a fiscal year 1991 issue.

Senator **DeConcini**. Fiscal year 1991 issue.

Does that mean that you will include some construction money in next year's budget?

Mr. **Frederick**. That means it will go into the fiscal year 1991 budget formulation process; yes, sir. We hope that it will survive.

Senator **DeConcini**. Thank you, Mr. Secretary.

Mr. Secretary, that is very helpful.

INDIAN WATER RIGHTS SETTLEMENT

A subject matter that you are constantly confronted with is Indian water rights settlements. As you know, the previous administration, your Department took an aggressive policy of negotiating these settlements. As a matter of fact, I think you were part of that, Mr. Secretary, over on the House side, getting the administration to do so. As a result of these efforts, we were successful in enacting the three settlements that Congress has approved. You have indicated that this policy will continue.

Can you provide the committee with the status of the Department's effort to negotiate other Indian water rights; on which ones have negotiations actually begun? And do you anticipate any being settled this year?

Secretary **LUJAN**. No, I cannot give you a definite answer like that. I will tell you that we are a little bit concerned, the amounts—we need $110 million to fund the trust funds settlements passed in the last session of Congress. There is $15 million in the BIA 1990 budget for this purpose. That is a concern. As we move along we must be sure that we have the adequate funding. But I can tell you there is a lot of them under negotiation, because—go ahead.

Mr. **ITTEILAG**. I was going to say, Senator, perhaps what we could do is put a comprehensive list in the record along with the status——

INDIAN WATER RIGHTS SETTLEMENTS

At present, the Department is pursuing five settlements: Fort McDowell Reservation, Gila River Indian Community, Warm Springs Reservation, Fort Hall Reservation, and Jicarilla Apache Tribe.

We cannot predict when final resolutions will be found in the negotiations; however, we are optimistic that the settlements can be concluded before the end of the 101st Congress.

UNFUNDED SETTLEMENTS

Senator **DECONCINI**. What do you think is going to happen? I understand they are in negotiation. My concern, Mr. Secretary of course, is if we enter into these things and then we cannot fund them, you know, we all lose face.

Certainly the administration does and how are we going to fund this one when, well, maybe you have not had a chance to get your footprint in there firmly when only $15 million is asked for upwards of $100 million of settlements has been approved, $75 million having to come from the U.S. Government.

Secretary **LUJAN**. I know we can depend on you, Senator.

Senator **DECONCINI**. That is what I am afraid of, Mr. Secretary, is that you are depending on us and this committee to take that money from other projects and that is awful hard to do.

Secretary **LUJAN**. I meant that facetiously. We are working with OMB to try to resolve the issue.

Senator **DECONCINI**. I am sure you have thought about this, but if this committee does not have a direction to go from you, and we take it out of other Indian programs if that should be part or any of it, it seems to me to be a disincentive for future successful negotiations and I am sure you have thought of that, but I wanted to bring it to your attention.

CENTRAL ARIZONA PROJECT

My last series of questions deal with our favorite subject in Arizona, and that is the Central Arizona project. I wonder, Mr. Commissioner, maybe you can help me more than the Secretary because you were part of the Cliff Dam negotiations that we put together, which was unanimous in our delegation.

The Bureau was charged as part of that plan 6 modification of Cliff Dam to work with the Army Corps of Engineers to identify appropriate flood control solutions for the Salt and Verde Rivers to replace the flood protection Cliff Dam would have provided. What is the status of the Bureau's and the Corp's efforts to identify possible flood control solutions on the Verde and Salt?

Mr. DUVALL. Those studies are continuing. The time for them to be finalized escapes me right now, but it is my recollection that it is close to the end of this year.

Senator DECONCINI. Do you know of any identifiable sources, or have you looked at it at all?

Mr. DUVALL. For the flood control protection?

Senator DECONCINI. Yes, sir.

Mr. DUVALL. There are options and alternatives that are being investigated, but I do not think a best solution has come up yet and I do not think it will ultimately come down to one single method. It will be a combination of different approaches.

Senator DECONCINI. Would you kindly task your department and see whether or not they have identified any sources and let us know just—so I can look at them, too? Just in the process of the study, realizing that that is not the end.

Mr. DUVALL. We will get you a briefing on that.

Senator DECONCINI. Also, the Bureau was directed to identify potential sources of water to replace this, as well as the flood control, so if you can tell us preliminarily any of the identities of what these water supplies would be it would be helpful to us, just so we know what you are looking at in case there is something that you are not looking at and we would like to bring to your attention.

Last, Mr. Commissioner, is there sufficient funding in the 1990 budget request to continue with these efforts that you are charged to do under the plan 6?

Mr. DUVALL. Yes; we have requested the money that we need to keep all of the Central Arizona project initiatives on timetable.

Senator DECONCINI. Will you supply me with the actual date when the recommendations are going to be available? I have forgotten, also.

Mr. DUVALL. Yes; we will do that for you.

Senator DECONCINI. Thank you very much, Mr. Commissioner. Thank you, Mr. Secretary. Mr. Chairman.

Senator BURDICK. We will now hear from the Senator from Idaho.

POLICY ON COMPLETING PROJECTS SUBSTANTIALLY UNDERWAY

Senator MCCLURE. Thank you very much, Mr. Chairman. The first question I am going to ask I am sure you would be interested in, because it indirectly affects Garrison project. See—I got his attention right away.

Mr. Secretary, when we shifted—and it was a shift that I supported—the funding for reclamation projects so we could fully fund and move a few forward rather than scattering our money about, it made fiscal sense to me, although it presents political difficulty to the project sponsors and the political figures that represent areas where projects are located, when there is no money expended at all upon a project.

At that time, we—the distinguished Senator from North Dakota and I, in particular—asked a number of questions about that policy that put some projects on hold while others got expedited treatment through more full funding.

My first question has to be, are we still keeping faith with the pledges that were made at that time that that process was not simply a way of pushing other projects back to the point they would never be funded?

GARRISON DIVERSION UNIT, ND

Secretary LUJAN. Yes, sir; in the case of Garrison—you know, that has not been abandoned. We are not, of course, funding it like we are the Central Arizona project or Utah project. What did we put into it?

Mr. DUVALL. $8,750,000.

Secretary LUJAN. $8,750,000 to keep it going. I realize, Senator McClure and Senator Burdick, that $8,750,000 is a figure that has not been acceptable to this committee in the past. But we are not saying we are not going to build it.

PROJECTS PLACED ON HOLD

Senator MCCLURE. Mr. Duvall, you remember that at that time we discussed some specific projects. We said, if you are going to move forward on Central Arizona and the Ute settlement and a number of things of that nature that are going to absorb a lot of money, that means other projects are going to wait.

You presented the justification for that kind of a policy that illustrated on the face of its justification that the projects that would be asked to wait would still get completed more rapidly than they otherwise would have gotten completed. Is that not correct?

Mr. DUVALL. That is correct, Senator. Both myself and Secretary Hodel testified to the effect that not only was the construction, but also, the planning processes being placed in something of a moratorium in order to expedite the completion of the projects that were most nearly complete.

We clearly had in the record at that time testimony that indicated that it was not our intent to abandon any projects and in fact that was the reason that we were placing a hold on new planning starts was so that new planned projects would not come along and compete with those projects.

DELAYED COMPLETION DATES

Senator MCCLURE. Now, if I recall correctly—and I have not gone back to check the record, but if I recall correctly you had the illustrative timetables for all of the projects that you were then involved with that would indicate that the projects that were not on the expedited completion schedule would still get completed prior to the dates that they otherwise would have gotten completed.

Mr. DUVALL. That is correct. That was based on a minimum construction funding of about $650 million a year.

Senator MCCLURE. Have you looked at that schedule for the completion of the projects for which you have not requested that kind of funding and can you still tell this committee that those projects that are not funded as fully as they heretofore have been will still be completed before their previous scheduled completion dates?

Mr. DUVALL. You are asking the right question, Senator. If we can maintain a construction program at $650 million a year the same response would still come forward.

What is pinching these two projects that are placed into a considerable holdback in this year's budget is not really so much the expenditure that would be necessary in order to carry them forward this year, but because that would cause additional spending to go forward next year and the year after that.

In order to meet the Gramm-Rudman-Hollings targets the administration and the Congress has been endeavoring to find ways to be sure that they do not get locked into large expenditure initiatives that are going to impact the program in fiscal year 1991 and fiscal year 1992.

That concern caused the Office of Management and Budget and the administration to hold the construction spending down this year, so that we did not get into spending programs that would make it impossible to hit those targets in the subsequent 2 years.

FUNDING RESTRAINTS VIOLATE COMMITMENTS

Senator MCCLURE. Let me rephrase that so that I may be sure that I understand correctly: That the commitments that were made are not going to be kept because the total amount of money is being reduced?

Mr. DUVALL. If our number drops significantly below that $650 million level, then some projects are going to suffer because there will not be enough money to go around.

Senator MCCLURE. The reason I take a little time is that I and others joined in support of what you laid out for us as a more rational and more economical way of completing the projects that we are working on—to get them done faster, at lower cost, by doing it this way than we would spreading the money across a larger spectrum of projects and I think many of us—and I think you were among those who recognized at that time—that that required a commitment on the part of the Congress that the future funding for the program would not fall.

Because, the future funding for the program falls, then the people who stepped aside in order to give you the opportunity to better manage construction projects—those who step aside will be ultimately hurt if funding slips over that period of time.

Mr. DUVALL. That is correct, Senator.

Senator MCCLURE. I think we in the Congress joined with the administration in making a commitment that that would not happen. I am not sure that OMB knows that—or cares—and I recognize it is not fully your responsibility. You do not manage OMB, if indeed anyone does. [Laughter.]

But I really am—I am concerned. I think the American public have a right to be able to depend upon commitments made by their Government and sometimes it should be the Government of the United States, not Colonel North in the dock, down before the Federal Court for lying to the American public.

Mr. Secretary, you looked like you were about to respond.

Secretary LUJAN. I do not know that that is in the same category. I do not want to send Commissioner Duvall to jail, or anybody——

Senator MCCLURE. I am not suggesting you go to jail, but I do really want to underscore the fact that the Government made a commitment and the Congress made a commitment and I am not talking about projects in the State of Idaho. I am talking about a commitment to a lot of people in a lot of different places, that we had a construction program that we are committed to.

We are going to fund it in a slightly different way in order to save some money, but we are not breaking the commitment. So we said, OK, we will do that. Immediately after we started doing that, then we say oh, by the way, we changed our mind. Those of you who stepped aside, or that were pushed aside, in order that we do this more efficiently, are going to be the ones who suffer the loss.

I do not believe that is a moral way to run a Government, let alone the questions of budgetary priority, which are separate questions and I share fully with the Senator from Oregon the feeling that the emerging crisis in this country is a water crisis. We saw little hints of that in the last 2 or 3 years as we had spot droughts around the country.

Senator HATFIELD. Would the Senator yield?

Senator MCCLURE. I would be happy to yield.

MITCHELL ACT VIOLATION

Senator HATFIELD. I would like to associate myself with what the Senator is saying that this kind of agreement does have full force of contract, but I would like to say that there is even a worse case scenario, because this was sort of a gentleman's agreement that has now been violated—or possibly to be violated—and that is the Mitchell Act.

There, it was a law established by the Congress, signed into law by the President of the United States, that committed the Government—the Federal Government—to sustain the fishery resources of the Columbia River that would be endangered or would be damaged by the installation of the hydroelectric facilities of Bonneville Dam.

That was a law, and out of the last—what, 12 years?—of Democratic and Republican presidents, not one time in 1 year did any one of those two presidents in 12 years acknowledge that that law had any impact or any significance whatsoever. They excised the funds each time it had even been requested by the agency to fulfill the contract under law—not a gentleman's agreement or to change a procedure, or plan. I think the Senator is right on target—and then we expect the people to have respect for law in this country.

Senator **McClure**. I thank the Senator from Oregon. I agree with him and obviously that question on the Columbia River, a fish passage, has a history of its own. It involves the Corps of Engineers in recent years more than it does the Bureau of Reclamation.

NEED TO KEEP COMMITMENTS

But you are involved in those discussions, nearly always there is an interagency group that determines what ought to be done and I urge you to look at commitments that have been made that have both the force of law and the force—I hope there's some force behind a gentleman's agreement—in which the administration, the President of the United States, and his Cabinet people, together with the Congress, make commitments to other people.

I think far too often Congress believes those—and administrations—believe those commitments are there to be broken, not to be kept. I guess that is a way of saying if I get lied to the first time, that maybe somebody else's fault, but the same group lies to me the second time, that is my fault if I accept that at face value.

JACKSON LAKE DAM/RESERVOIR

Let me for a very brief moment ask a question on a more parochial subject. Can you give me an update on the situation at Jackson Lake Dam?

Mr. **Duvall**. The situation at Jackson Lake, Senator, is that the safety of the dam's work has been completed there. The reservoir is in the process of being refilled. We expect it to hit an elevation this year of 6,763 feet, which is still a substantial amount of water but less than full. The full reservoir level is 6,769 feet, so it will top out somewhere this spring in the run-off period about 6 feet below full.

Senator **McClure**. Why is it—is that just to test the structure? Is that a matter of caution, it is less than full?

Mr. **Duvall**. It is a question of the available run-off.

Senator **McClure**. It is the available run-off, so there is not a sufficient run-off to fill the lake this year?

Mr. **Duvall**. That is correct.

Senator **McClure**. I do not know why I say lake, because I usually insist on saying, that is Jackson Reservoir. That beautiful lake in Jackson Hole is the result of expenditures made by irrigators in Idaho, and I want people to understand that the beauty we have added to Wyoming is because of expenditures made by people in Idaho.

ANIMAS-LA PLATA PROJECT, COLORADO-NEW MEXICO

Last Congress the President signed the Colorado Ute Settlement Act and part of that settlement was completion of the Animas-La Plata project to provide alternative water supplies to the tribe. A schedule was contemplated for completion. Is this budget, together with what you are contemplating over the next few years, adequate to fulfill the Federal commitment to that settlement?

Mr. **Duvall**. What we have in this budget request is $3.7 million which will continue the design data collection and the preconstruction-type activities.

Again, this is a project that under the policy that we have been discussing of completing those projects that are well underway, we have been somewhat reluctant to press this one into construction so that we have yet an additional project competing for scarce construction resources.

Senator McCLURE. Was there not last year a commitment made?

Are you telling me that last year a commitment was made and this year we are breaking it because we were afraid we might not have enough money?

12-YEAR CONSTRUCTION SCHEDULE

Mr. DUVALL. I do not believe we had a commitment to go into construction this year.

The agreement and the legislation authorizing the project took place last year, and that authorization does have a 12-year construction cycle in it.

Senator McCLURE. It has a construction cycle in it.

I am looking at your justification. It says, "Preconstruction activities," and then I read the balance of that sentence, "and acquisition of office space and equipment."

You are going to get your staff housed and officed so they can study?

Mr. DUVALL. There is a construction office that has been located down there.

Senator McCLURE. Then it goes on, "For the purpose of this budget submission construction of this project is not contemplated with the 1990–94 budget period.'

Mr. DUVALL. The reason for that is because there is no construction funds for the outyears in the passback that came back from OMB.

Senator McCLURE. Well, is that not an absolute violation of the commitment entered into last year?

Mr. DUVALL. I would not be able to say that it is a violation of the commitment. It is a delay of the expected start-up time for construction.

Senator McCLURE. Was there not anything understood between yourselves and the project sponsors and the Indian tribe involved with respect to the initiation and construction of a project? You mean they signed up on a check on which you can fill in the dates to suit your convenience?

Mr. DUVALL. No, there is a 12-year construction period that is in the negotiated agreement.

Senator McCLURE. If there is no construction between 1990 and 1994 budgets, will you meet that commitment?

Mr. DUVALL. I would have to check into that and give you an answer for the record.

Senator McCLURE. I think you would have to say no. So, I hope you will, but I hope you know when you answer that question for the record as you will, I am going to read the answer.

Mr. DUVALL. OK, we will get you that answer.

Senator McCLURE. Because I do not believe you can do it, Mr. Secretary.

Mr. DUVALL. There is no question but what your line of questioning is correct. We do not know in some cases how we are going to fulfill all those obligations either.

Senator MCCLURE. Great White Father still speak with forked tongue.

ANIMAS-LA PLATA COMPLETION

According to the Water Rights Settlement Agreement, the tribes may commence litigations or negotiations of their reserved water rights claims on the Animas and La Plata Rivers if water from the Animas-La Plata project cannot be made available to the Ute Tribes by January 1, 2000. Since the estimated construction period is about 12 years, this date may not be met.

FUNDING CONSTRAINTS

Mr. DUVALL. Well, at the same time, that is precisely the reason that drove Secretary Hodel and myself to arrive at the conclusion that we need to go into an early decision to start curtailing the number of projects that are under construction at any one time. There just simply is not enough money in the well over at OMB.

We would love to have them give us some money. We would love to be out there in construction at Animas-La Plata today, but there is no money coming out of that well. Until it is identified, we do not really know, Senator, what else to do.

FEDERAL GOVERNMENT'S FAILURE TO HONOR COMMITMENTS

Senator MCCLURE. It seems to me, if I recall correctly my chart of Federal Government operation, the Bureau of Reclamation is a part of the same government that has the Bureau of Indian Affairs.

It is even in the same department of Government.

Mr. DUVALL. That is correct.

Senator MCCLURE. The department—and that department of government is the Department of the Interior in both instances.

We have the Bureau of Indian Affairs negotiating an agreement, the Bureau of Reclamation promising to carry it out.

At the same time I see the Office of Management and Budget which seems more like a foreign entity than it does a member of this own administration and this Government with a different schedule, with a different set of priorities in no way being bound by laws passed by the Congress of the United States and signed by the President of the United States. I do not understand that.

I do not understand how last year the administration through the agencies, one of which you head, did last year do this year cooperating with other agencies of Government make commitments enter into arrangements and agreements merged into laws, signed by—passed by the Congress of the United States, signed by the President of the United States, and immediately following that—not some time later, but immediately following that—say oh, well, I do not think we will live up to that agreement.

You know, if I tried that, I would end up in jail.

I am not sure but what we are going to have to do that with Federal agencies and bureau heads, secretaries even, to say if you lie to the public, you go to jail.

You know, Colonel North—I understand the jury is coming in this afternoon. They have sent word to the judge they have reached a decision and judge his guilt or innocence about having lied to the Congress.

How about the Congress lying? Are we going to be subject to the same standard we are setting out for other people?

Or are we somehow immune, you and I, because we are in charge of the Government, we can blame flunkies like Colonel North for carrying out his orders, but we who give the orders are immune from the same standard of conduct.

It seems to me that that is exactly what we see in the Colorado Ute settlement. It is even worse than the other with respect to the Garrison project because it is more pointed and it is more immediate.

Mr. **Duvall**. We are sympathetic to your comments——

Senator **McClure**. Particularly if you go to jail. [Laughter.]

Mr. **Duvall**. Anything that is going to cause someone in the Department of the Interior to be confronted with problems of being in violation of laws is going to be a matter of concern. We have a great deal of anxiety over the commitments that get placed on us that we cannot fulfill.

Senator **McClure**. Well, there is a way around it. I know. Congress found it last year.

We will enact a Manassas Battlefield taking and get it through the Claims and Judgment Act instead of through appropriated accounts.

EFFECT OF DIFFERENT LAWS

Secretary **Lujan**. Senator, I might just make a note of it.

One of the things that we are confronted with—and so is OMB as a matter of fact—I have never been too much of a defender of OMB, but now I am in a little different position than I have been over the years.

But we are confronted with two different laws or several different laws.

On the one hand, the spending laws that you talk about and on the other hand, the Gramm-Rudman law that mandates that we keep to certain numbers, and you have to take those two together.

You know, I would not condemn people for lack of faith. I think they get caught between a rock and a hard place.

You either obey one law or the other, and that is where the matter stands.

Senator **McClure**. Well, Mr. Secretary, I appreciate the answer, and it is accurate, and I do not mean to exempt from that the responsibility which the Congress has. The Congress passed both laws.

It obviously in this instance did not intend to comply with a law that was passed and commitments made and agreements entered into. I find that totally, totally inexplicable.

We did not say to the Utes we will do this if we can find the money.

Secretary **Lujan**. Let me make one other point concerning these negotiations on different water contracts and those sorts of things.

NEED FOR NATIONAL WATER POLICY

One of the things that has troubled me and—was it Senator Johnston or Senator Hatfield that said about—that we need a national water policy?

Senator McCLURE. Hatfield.

Secretary LUJAN. It concerned me, as a matter of fact, while I was in the Congress, you know, all kinds of people went out making all kinds of arrangements and all kinds of deals, and they would come to us in the Congress and say now everybody agrees with this.

My thought was always, well, is the guy that is going to pay for it, Uncle Sam, does he agree?

Well, that is what we are going to do now. We are going to agree to it through the Congress.

But generally, a lot of the Indian water rights agreements are made without the input of the Federal Government in them to a certain extent, and then things like this result from it.

Senator McCLURE. Mr. Secretary, I understand that, and I agree with what you say.

As I said earlier, the Congress participates in that too, and the Congress is equally guilty.

It just pains me when on this particular day we see Colonel North, whom I regard as a very loyal, steadfast American, a man who did his very best to carry out his directives as he read them, in the dock for trial for having done no worse than you are doing today and I am doing today in lying to the American public about what are our projects and what our commitments are.

PREPARED QUESTIONS SUBMITTED FOR THE RECORD

Thank you, Mr. Chairman. I will submit the balance of my questions in writing.

[The questions and answers follow:]

QUESTIONS SUBMITTED BY SENATOR JAMES A. McCLURE

BUREAU OF RECLAMATION

DEER FLAT DAM, BOISE PROJECT

Question. I am concerned about the situation at Deer Flat Dam near Caldwell. Could you update me on the current situation with water levels at the dam, any leakage occurring at the dam and the plan of action dealing with repairs mandated by the safety of dams act?

Answer. As Lake Lowell filled this spring above elevation 2,525 feet, concern arose regarding increased seepage activity observed at both the upper and lower embankments. Active sand boils and apparent piping of sand from a drain outlet were also observed. As a result of this concern, Reclamation and the Boise Project Board of Control jointly agreed on April 30, 1989, to begin drawing the lake level down approximately 1 foot over the next 10 days to elevation 2,525 feet. The Board indicated that this operation would not have major impacts on irrigation supplies this year. Continuous daylight surveillance of the embankments was initiated and will continue until the lake drops below this elevation and conditions stabilize.

It is unlikely that the lake will be allowed to fill above elevation 2,525 feet prior to completion of the repairs to correct safety deficiencies at the dam. This restricted operational level limits storage in the upper five feet of the reservoir, representing a reduction of approximately 45,000 acre-feet of storage or about 27 percent of the total active capacity at Lake Lowell of 169,000 acre-feet. Reclamation engineers believe that the lake can be safely operated over the short term at this level.

Safety problems at Deer Flat Dam are the result of original design and construction techniques which do not meet today's state-of-the-art requirements. A Modification Report is currently being prepared which outlines proposed modifications to Deer Flat Dam. The proposed modifications would include constructing filter/drain systems and berm fills along the downstream toe of both the upper and lower embankments. Also included in the repairs would be reshaping and placing riprap on the upstream face of the Lower Embankment and restoring missing portions of the parapet wall. Estimated cost of the modifications is $29 million. Boise Project water users will be required to repay 15 percent of the total construction costs.

The Modification Report for Deer Flat Dam is scheduled to be completed and submitted to the Congress this year. A construction contract could be awarded as early as June 1990. Construction would be completed in about one year. Upon completion of construction, Lake Lowell would be returned to full operational status.

LAKE WALCOTT PARK AND DAM UPGRADES

Question. I have been contacted by local citizens of the Rupert area concerning the progress of the upgrading of the Lake Walcott Park. I want to thank you for your support of this project and commend the regional and local bureau offices for their enthusiastic support of this project. I am however concerned over the expense of the planning and development work and the time it has taken to implement the plan. It now appears that the project will not be completed in time to celebrate the Idaho Centennial. Is there any possible way to move this project along faster? Also please give me a status report on the progress of the upgrading of the dam at Lake Walcott.

Answer. An estimate of $2.5 million for Walcott Park was developed in May 1988. This estimate covered all minimum basic facilities, related contingencies, engineering, overhead, and mobilization for the project. The Senate report on the Energy and Water Development Appropriations Act for fiscal year 1989 directed the Secretary of the Interior to use $760,000 of available funds to construct recreation facilities at Walcott Park. That amount would provide for only minimum basic facilities, i.e., vault restrooms, basic road system, one loop of the campground, and the park water system. That amount of development would not accomplish all elements as identified in the planning and public involvement process.

The present estimated cost of $3,660,000, of which $660,000 will be contributed by local entities for development of Walcott Park, reflects a preliminary total construction cost estimate based on the final master plan and includes a level of facilities beyond the minimum basic. The costs also include contingencies, mobilization, engineering design costs, and construction supervision.

The higher development costs include a wastewater treatment system and domestic water system that are necessary to support the level of use experienced at Walcott Park. Originally only vault toilets were proposed, but with the modification of the powerplant scheduled, it was decided that the park would include a wastewater treatment system that could accommodate the needs of both the park and the powerplant. The plans for the domestic water system were upgraded extensively to provide for the flush toilets and the inclusion of the powerplant's water requirements. The original domestic water system was limited to a minimal number of hydrants strategically sited within the park. The costs of the facilities shared by the park and the powerplant will be prorated appropriately.

Approximately $200,000 is being spent for the planning, development of conceptual plans, collection of field data, and final designs. Costs associated with the planning process reflect contract costs for the detail design of a complex project. The project elements include a wastewater treatment system, domestic water system, roads, electrical system modifications, restrooms, and boating facilities. The design development process for a complex project such as this typically takes 8 months to 1 year to complete.

The plan is to phase the construction. The first phase includes the potable water system; wastewater treatment system; roads, parking, and a 25-unit campground; boat docks; electrical system modifications; and trails and landscaping. The total estimated cost is $2.4 million of which approximately $500,000 will be in local contributions.

The process undertaken to plan, design, and develop this project has progressed quickly in a very compressed timeframe. We are presently in the design development process with a private contractor completing the work. Detail design of the park elements began in January 1989 and the work will be complete by June 1, 1989. The specifications and contract drawings for the first phase can be ready for the bidding process by August 1989 with bid opening occurring in October 1989.

However, the funding available through fiscal year 1989 is not sufficient for a contract award. If an award can be made promptly, construction could begin in November 1989 with a scheduled completion date set for July 1, 1990.

The other work at Minidoka Dam includes replacement of the spillway gates and rehabilitation of the powerplant. A contract is underway to provide an access road and bridge to facilitate the replacement of the spillway gates on Minidoka dam. The contract for the replacement of the spillway gates is scheduled to be awarded in June 1989. This work will be completed by the spring of 1990. The Minidoka powerplant rehabilitation work is also moving ahead on schedule. The solicitation for providing the new turbines and generators is out and those proposals are due in May 1989. The contract is scheduled to be awarded in November 1989. The design work for the other contracts is also on schedule. The rehabilitation of the powerplant is scheduled to be completed in 1992.

TETON DAM STUDY

Question. The State of Idaho Centennial Legislature passed a joint memorial concerning the Teton Dam. Interest in rebuilding the Teton Dam remains high in Idaho. Many questions remain as to the status of the dam structure. To answer some of these questions, a reconnaissance study has been suggested. The study would review the need of such a dam including the need for flood control, power generation, fish mitigation, additional headwater storage for irrigation, and providing water for settlement of Indian water claims. It would also estimate the cost of rebuilding the dam and indicate the cost/benefit ratios involved. Local support levels would be gauged as well as the environmental impact of the project. The total expected cost of such a study has been estimated by the regional Reclamation office as being approximately $200,000 to $300,000. Does Reclamation have funds available in the fiscal year 1989 budget to begin such a study? How long would it take to complete such a study? Could you direct your regional office to hold a meeting with all involved entities which would decide how best to proceed with this study?

Answer. The Bureau of Reclamation does not have funding in fiscal year 1989 to initiate a reconnaissance study. Also, funds for a study have not been included in our fiscal year 1990 budget proposal.

Reclamation staff would be glad to meet with local interests, State of Idaho water policy managers, and others to discuss the objectives of a reconnaissance study and the critical criteria items that should be addressed. Based on conclusions of the scoping activity a cost estimate and a timeframe could be developed.

GARRISON DIVERSION UNIT, ND

Senator **BURDICK**. Mr. Secretary, I notice with continuing dismay that you are only requesting $8.75 million for the Garrison project for fiscal year 1990.

After all the trouble we went through to get the Reformulation Act of 1986 passed, I might add with the support of the Department of the Interior and the Reagan administration, I just cannot see the logic in this proposal.

Is it true that the Department of the Interior in its original submission to the Office of Management and Budget, requested approximately $62 million and that was passed back at $2 million, is that correct?

Secretary **LUJAN**. Yes, sir.

Senator **BURDICK**. I did not get your response.

Secretary **LUJAN**. Yes, sir.

Senator **BURDICK**. My information is that the Department then appealed that decision and requested approximately $48 million which was returned to you at the current $8.75 million; is that correct?

Secretary **LUJAN**. That is basically correct; yes, sir. That is correct.

Senator **BURDICK**. Did OMB offer any suggestions of substance on how to fund existing contracts or damages for their breach, mothball the project, provide for personnel cutbacks and reallocations within this wholly arbitrary figure?

Secretary **Lujan**. No, sir.

IMPACT OF FISCAL YEAR 1990 FUNDING FOR GARRISON

Senator **Burdick**. The Garrison Diversion Conservancy District has provided me with the following impacts on the project if we were to proceed with the OMB's level of funding for fiscal 1990.

One, all MR&I starts indefinitely postponed.

Two, Indian reservation water projects stalled.

Three, recreation programs including construction of Devils Lake State Park stops.

Four, Oaks test area, irrigation terminates.

Five, construction on New Rockford Canal stops with $2.5 million to $5 million damages to contractor for breach of contract.

Six, southwest pipeline project comes to a halt.

Seven, Garrison water for Fargo, Grand Forks, and the Red River Valley communities put on hold indefinitely.

Eight, wetlands and wildlife mitigation enhancement program grinds to a stop.

Nine, major irrigation postponed into the unforeseeable future in spite of recent drought experience.

Ten, economic development and general economy improvement handicapped further hurting the possibilities of recovery from the current economic recession.

Do you agree or disagree with those conclusions?

Secretary **Lujan**. The conclusions are substantially correct. I am not quite sure that we have to stop all those activities, Senator. The $8.7 million shows that we would spend $1 million on the New Rockford Canal; $2.2 million on the State MR&I system; $2.8 million on fish and wildlife activities; $170,000 on recreation; and $2.5 million for operation and maintenance.

I do not think it is our intention just to shut down the project as might be indicated by those figures that you quoted, Senator. I think that this is kind of a way of keeping it limping along. That is probably the best expression that I can use.

Senator **Burdick**. The numbers you just referred to are a far cry from the $30 million that was appropriated the year before.

Secretary **Lujan**. Yes, sir; that is very low.

REACTIVATION OF GARRISON DIVERSION UNIT IF 1990 FUNDING LEVEL IS SUSTAINED

Senator **Burdick**. If the administration's budget for Garrison for fiscal 1990 were approved, how long do you think it would take to reactivate the project at a later date?

Secretary **Lujan**. I am sorry?

Senator **Burdick**. How long would it take to reactivate the project if this figure stands?

Secretary **Lujan**. Let me ask the Commissioner of the Bureau of Reclamation how long it would take to reactivate the project.

Mr. **Duvall**. If we only receive the $8.75 million appropriation request for fiscal year 1990, the project will incur a significant cutback in personnel forces, and the reactivation would take some time. To make an estimate as to how long it would take might be a little bit difficult because it would have a different level of response time in the Indian reservation portions of the project because most of that work is being done by contract and in cooperation with the tribal leadership.

So, some of those things might come back very rapidly. Other elements we were dependent upon, engineering design forces and that sort of thing that we perform with our own crews, would take longer.

Senator **Burdick**. There would be at a minimum a 4- or 5-year delay, would there not?

Mr. **Duvall**. That would depend, again, on how much——

Senator **Burdick**. Or more.

Mr. **Duvall** [continuing]. How much money came to us when money started flowing to us again. If we start getting a lot of money, you can react and respond quite rapidly. If you are only going from $8 million up to $12 million as opposed to $65 million, it takes a lot longer.

OUTYEAR FUNDING REQUIREMENTS

Senator **Burdick**. But we talked about that. How much money are you going to give us next year?

Mr. **Duvall**. In the budget passback, the only thing that would show in the outyears for the Garrison project would be the minimum basic facilities for operation and maintenance of the investment that is already made in sunk costs.

Senator **Burdick**. Based upon this history, it would not exceed $8.75 million, would it?

Mr. **Duvall**. It probably would require a little more than that next year, because there are some contracts that would have to be terminated.

Senator **Burdick**. Is this all necessary?

Mr. **Duvall**. Is it necessary?

Senator **Burdick**. The cutback, yes.

Mr. **Duvall**. It is necessary to make those cutbacks unless we can identify and obtain additional funding, it will be necessary to make those cutbacks.

My budget officer tells me that the outyear number is listed at $3 million, and that does not include contractor claims.

Senator **Burdick**. Well, I think we have reached a sad state of affairs where we have got a solid project, solid by the opinion of every administration through the last 20 years, and have to come to this halt, because we are not going to do anything with $8.75 million.

It is hardly more than a mothball situation, is it not?

Mr. **Duvall**. That is correct.

Senator **Burdick**. Senator Reid.

FEDERAL FUNDING PROBLEMS

Senator **Reid**. We will take it.

I am sorry that the senior Senator from Idaho is not here. I just want the record to reflect because none of us—it is not for any of us here, it is for the public's exposure. I certainly in no way, regardless of how we individually might feel about Colonel North, would not put any of you gentlemen in that category recognizing that in all my dealings with administration witnesses, I can only think of one occasion when I have known of anyone deliberately lying.

I know that with all these money problems we have, it makes it very difficult for us, it makes it difficult for you to try to do all the things that you are required to do because of actions of the executive branch of Government and the congressional branch of Government.

It seems that you are the ones that we can always look to to criticize because there is not enough money to go around. The fact of the matter is it is not your fault. You will spend all we give you. When I say we, I mean the executive and legislative branches of Government. So, I just want the record to reflect my feelings that certainly nothing that any of you have done is criminal in nature.

We all try to do as much as we can with a limited amount of money. I do not think we need to say more on that.

NEVADA SWAMPLAND MARSHES

It is interesting that Chairman Johnston would talk about wetlands coming from a State like Louisiana where that is—we visualize the swamps, the bayous, and all the water down there, but we in Nevada have a similar problem and everyone looks upon Nevada as a desert.

The fact of the matter is, nature does very unusual things to places, and the State of Nevada, even though we have no bayous, we do have some marshes, swamplands that have been there for at least 5,000 years and because they are there, nature has made that, we have not, people have not, but nature has made that part of the North American flyway, and water fowl and other kinds of birds from Canada and the northern part of the United States land there and store up energy to carry them again to areas where there is lots of water.

The problem is that area is drying up. In recent years we had as many as 50,000 acres of swampland marshes. Now it is down to less than 3,000 acres, and that water that is there is not good. A lot of it is poisonous.

I am sure, Mr. Secretary, you get tired of hearing me say this because just a day or so ago when you appeared before the Appropriations Committee I gave basically this same statement. But, in doing so, I want to impress on your mind as if it had not been done already 50 times as it has been, that there is no net loss of wetlands. We are going to put this to a test real soon because unless we do something in Nevada quickly, it is not a loss to Nevada. It is a loss to the country because Nevada makes no money off the swampland. We make money off of mining and tourism, not off of some water fowl being able to land there.

WATER TRANSFERS TO NEVADA WETLANDS

But we already have from last year $1.2 million that Senator Hecht and I got that we are trying to spend now. Now, I direct this question to the Commissioner of the Bureau of Reclamation. We cannot spend the money. We are having difficulty doing so. Private interests have raised some money, and we cannot get the water into the system and this is something I would ask you and your staff to look at.

It is all over Nevada. There are newspaper articles that say the Bureau of Reclamation officials deny allegations they are trying to stall planned water transfers to local wetlands because of political concerns.

Frank Demmick, regional Bureau of Reclamation Director in Carson City said Tuesday the Bureau agreed with the concept of transferring water to the shrinking wetlands but wants to be careful. In the process of being careful, each day more is drying up and more animals are dying. White pelicans that have to fly 60 miles from Pyramid Lake to eat, basically, now more are dying than are being born every year. So, it is a real problem. I would like you to look into that so we can speed up at least the private moneys that are being put into this. Is that a deal?

Mr. **DUVALL**. Yes; we are. The example that you cite is one of balancing the contractual rights of the agricultural community who are dependent upon the source of water and have State-allocated water rights with specific entitlements.

When there is insufficient supply to meet the needs of Pyramid Lake of the Indian tribe there, of the agricultural community and still during these relatively dry years we see Stillwater Reservoir sinking to lower and lower levels, there just is not enough water there to go around.

Senator **REID**. But, of course, Mr. Commissioner, we are not taking water either through these private sources or through the Government, the Federal Government in there purchasing these waters, but people are willing sellers of this water, and, of course, willing buyers are those that want to put that water into the marshlands, so we are not affecting the agricultural uses. People want to sell.

The problem is that there is a concern whether or not you can use the same waterways; that is, those that we built 80 years ago. The first project of the Bureau of Reclamation, of course, was this project, and whether we can use some of their same—some of the same system to put water out there, and that is really the problem that they have identified, as I understand it.

TRANSFER OF OPERATION AND MAINTENANCE TO WATER DISTRICTS

I have some other questions that I want to submit for the record. I do have, if I could, though, ask what is going to happen as local water conservation districts pay off these construction debts then take over the maintenance and management of the various projects.

What future role do you foresee for the Bureau of Reclamation in those projects?

Mr. **DUVALL**. As the projects——

Senator **REID**. Are paid off.

Mr. **DUVALL**. That reach full repayment?

Senator **REID**. Yes.

Mr. **Duvall**. Normally, barring those few instances in our service areas where there is specific language relative to what happens to them, normally the Federal Government continues to be the owner of the facility even though the repayment obligation has been paid off.

The Federal Government then, or the Bureau of Reclamation, would continue to participate in the oversight with respect to the level and the quality of the operation and maintenance practices that were associated with the project and would conduct an, I believe it is once every 5 years, operation and maintenance review of the district's operation and maintenance program. So, we continue to have a role there. The only charge the water users would be assessed would no longer represent a repayment obligation but only that part that would represent repayable and recoverable operation and maintenance costs that we would incur in servicing the district.

Senator **Reid**. Do you think that we should consider reorganizing the role of the Bureau into the local water districts and maybe into the private sector in these instances? You have indicated they are rare.

Mr. **Duvall**. Well, they are rare where the authorizing legislation provided for some other disposition after repayment.

What we have found in actual practice as districts—and there are a number of districts that either have paid off or are reaching full repayments—what we have found is that there may have been a 40- or 50-year period of time when they were looking forward to having their mortgage paid off much as you would with your personal home. Then when they get it paid off, they look at the cost of providing their own insurance for the stability of the structure. They look at the cost of providing the commitments to recreation and the commitments to wildlife preservation and that sort of thing that is shared by the Federal Government, and then they start saying wait a minute. We cannot afford to have you give this to us.

Senator **Reid**. I understand.

Mr. **Duvall**. Where they intended for many years to ask for the title and to have a mortgage burning party, in reality when they get up to the point of not having Uncle Sam as a partner into the future turns out to be a kind of thing that they do not want to give up lightly.

Now, they can protect themselves from some of the hazards of Government and that is that when a project is paid off, no longer has a repayment obligation to the Federal Government, then they do become exempt on requests to us of the obligations of acreage limitations under the Reclamation Reform Act. So, some of the constraints go away once they have repaid their obligation.

Senator **Reid**. Prior to closing the meeting, it goes without saying I am always happy to participate in hearings involving the Secretary of the Interior, especially you, Secretary Lujan, who I served with in the House and on the Science and Technology Committee. I am, as I indicated to you personally and to the President personally, I think your choice was outstanding and, of course, the Bureau of Reclamation which has such a large presence in the State of Nevada is important to the State of Nevada.

ADDITIONAL PREPARED QUESTIONS FOR THE RECORD

Thank you very much, Secretary Lujan and Mr. Duvall. Senator Johnston has additional questions for your response. Also, Senator Burdick, Senator DeConcini, and Senator Domenici have questions as well.

Thank you again, Mr. Secretary and Commissioner for your appearance here today. Your testimony has been very helpful.

[The questions and answers follow:]

QUESTIONS SUBMITTED BY J. BENNETT JOHNSTON

SECRETARY OF THE INTERIOR

Challenges and Problems of the Future

Question: Gentlemen, what do you see as the challenges and problems facing the Bureau of Reclamation over the next few years?

Answer: The Bureau of Reclamation is well underway in its transition to a water-resource management agency that addresses a wide set of resource opportunities. In looking for solutions to water resource problems, Reclamation's planners and engineers are considering a broad spectrum of alternatives, based on effective and environmentally sensitive resource management, in addition to structural options. By recognizing and responding to the changes in its planning and operating environment, Reclamation has already passed one of its greatest challenges.

The main challenges and problems facing Reclamation are to find acceptable, cost-effective solutions to the water resource needs of the West. Reclamation's priorities have been and will continue to aid the States and local units of government to meet these needs. The growth in water demand, however, must be met by more than surface-water development. Typically, solutions now involve groundwater resources and conjunctive use, water conservation on existing projects, system optimization, water quality preservation and improvement, and eliminating the threat of toxic wastes, and other environmental considerations. Reclamation must live up to the challenge by considering all these aspects of problem solutions while continuing to operate within the limits of Federal budgetary constraints.

Question: Budgetary pressures continue to reduce the level of effort in the programs of the Bureau of Reclamation in real terms, and the Bureau has been reassessing its role as an agency. Does this concern you? What do you see as the major mission of the Bureau of Reclamation in the 1990's and beyond.

Answer: Budgetary pressures have limited Reclamation's programs in recent years, although Reclamation is certainly not alone in this regard. My impression is that to date Reclamation programs have been faring well or average relative to other domestic agencies. My concerns are somewhat relieved because of the "new direction" approach recently taken by Reclamation.

I do not intend to allow the Nation to lose the unique and important expertise available in the Bureau. Their expertise in water resource planning and management is recognized and sought around the globe. In the next decade or two we could be facing a crisis in water similar to the one faced in oil a few years ago. The Nation will continue to need Reclamation's capability to develop and implement pragmatic solutions to water resource management problems.

Technical Assistance Program

Question: The budget request of Technical Assistance to States is $1.6 million for 1990 compared to around $900,000 for the current year. How do you explain the fact that the Administration is requiring a 50% level of cost-sharing on the Corps of Engineers technical programs and there is no indication of a similar requirement for your activities?

Answer: The Corps of Engineers' technical program is not comparable to the Bureau of Reclamation's Technical Assistance to States item in the General Investigations Program. The Corps' technical programs are complete study activities. Reclamation's technical assistance line item is used to assist States in portions of their study activities that are related to our projects or other Federal interests. We do not perform complete studies for the States.

Atmospheric Water Resources Management Program

Question: Discuss briefly the Bureau's activities in the Atmospheric Water Resources Management Program for 1989. What activities are planned for 1990?

Answer: I am informed the Atmospheric Water Resources Management Program in fiscal year 1989 is limited to administering the program as specified by the Congress which provided for "continued research related to cloud seeding and pilot training in North Dakota." An existing research grant with the University of North Dakota has been extended to accomplish this work. There are no activities planned for FY 1990.

Question: Are any Federal dollars being requested to support these activities? If so, provide a breakout for the record.

Answer: The FY 1990 request for the Bureau of Reclamation did not include funds for the Atmospheric Water Resources Management Program.

Question: Are there any proposals under review or consideration within the Bureau, Department, or Administration which would commit the Federal Government to a new operational/ demonstration program similar to that discussed last year? If there are, please provide a description of the program, including the level of Federal commitment, and a funding profile through completion?

Answer: I am informed there is no planned operational/ demonstration program for FY 1990. However, there is still considerable non-Federal interest in participating with the Bureau of Reclamation to develop weather modification on a cost-shared basis. It is unknown if these non-Federal interests would choose to fund the program without some Federal funding.

Animas-La Plata Project

Question: The budget request for the Animas-La Plata project is $3.7 million which would be used to bring the project to "reasonable conclusion". First construction funding was provided in the 1985 Supplemental Appropriations bill and additional funding in small amounts ($2-8 million) has been provided annually since.

This project is the center piece of a long standing water rights dispute in Colorado and New Mexico. At the urging and with the encouragement of the Administration, the Indian Tribes and other parties reached a settlement of the land and water right disputes outside of court. However, the Administration's budget does not support the settlement agreement which the Secretary of the Interior was a party too and which was enacted into law last year.

--- Does the $3.7 million budget for the Animas-La Plata project support the commitments to the Indian tribes as envisioned in the Ute Indian Water Rights Settlement Agreement Act? If not, why?

Answer: The Water Rights Settlement Act with the Indian tribes recognized that budgetary constraints might delay construction of the Animas-La Plata Project. The Department of the Interior is fully committed to meeting its obligations as required in Public Laws 90-537 and 100-585 as soon as relief from budgetary constraints permit. The Administration and Congress have reached a bipartisan budget agreement. We will be pleased to work with the Committee to determine if additional funding can be made available for this settlement within the framework of this agreement.

Question: How does the Department and the Bureau of Reclamation plan to meet the 12 year construction schedule called for in the [Animas-La Plata] settlement agreement?

Answer: The December 10, 1986, Colorado Ute Indian Water Rights Final Settlement Agreement specifies delivery of water to the Tribes by January 1, 2000. Reclamation believes that a 12 year construction program would be the most reasonable and efficient schedule for the Animas Project. The FY 1990 budget request does not include construction funding to begin the project in FY 1990. Consequently, I have asked the Bureau to reevaluate its construction plans as they relate to the water delivery requirements.

Question: What assurances do the Indians have that this project and settlement, which they have been trying to resolve for many, many years, will be given funding priority once the current larger projects are substantially completed?

Answer: If the deficit situation improves, our current estimates of funding needs of ongoing projects indicate funds should become available in FY 1991 or 1992.

Question: What does the term "reasonable conclusion" mean in terms of the Administration's use of the funds requested for 1990, and commitment to moving the project forward? Just how is the budget proposal a "good faith" indication that the project will move to construction?

Answer: By "reasonable conclusion" the administration means that all work will be terminated until such time as funds become available to construct the project on an efficient schedule.

Water Service Contract Renewal

Question: Could you bring us up to date on the status and activities of the Department of the Interior related to the emerging problem of renewal of expiring water service contracts with the Federal Government?

Answer: Pursuant to the Court Order issued on April 4, 1989, in U.S. District Court, the Department is permitted to execute a renewal contract with the Orange Cove Irrigation District, the first of 28 long-term contracts to expire in the Friant Unit of the Central Valley Project, the latter of which has a total of close to 300 water service contracts. The Environmental Protection Agency (EPA) believes an environmental impact statement (EIS) should be completed before the Friant Unit renewals are executed and therefore has referred the matter to the Council on Environmental Quality (CEQ). CEQ accepted the referral, held two public hearings, and accepted written comments through April 28, 1989, on the matter. CEQ is expected to take some action on the referral in mid-June.

Pursuant to the Court Order issued on April 4, 1989, I made the decision that the Department, working with the State of California, would go forward with the contract renewal process with the understanding that the Department would take whatever appropriate steps within its power to protect environmental interests. In accordance with the order in NRDC v. HOUSTON, the renewal contract includes a clause stating that the terms of the contract remain subject to the final decision of the court. Further, a new subarticle has been added to the contract which clarifies (1) the role of the state in originally providing water rights under permit to the United States, (2) the obligation of the United States and the contractors to amend their agreement in response to certain modifications of that permit by the State Water Resources Control Board, and (3) the obligation of the United States to defend its project water rights. With these inclusions, on April 11, 1989, I approved renewal terms for the Orange Cove Irrigation District's water service contract for a 40-year period.

Question: What is the Administration's policy regarding renewal of these contracts? What agencies are involved and who has primary responsibility?

Answer: The Administration's policy regarding renewal of these contracts is guided by three basic principles: (1) the Federal Government has both a legal and moral obligation to the Friant Unit water users; (2) the State of California has the primary authority to determine basic water rights and entitlements on the basis of beneficial use, water quality, and other regional considerations; and (3) within the framework of the longstanding obligations, it must be recognized that the renewal of long-term water supply contracts may pose legitimate environmental concerns. The Department of the Interior has the lead and primary responsibility for contract renewal. If a fishery restoration or endangered species issue arises, the Department's Fish and Wildlife Service would be involved. Also, related California State agencies would be involved as necessary.

Question: What are the issues involved and what is the Department doing to resolve those issues?

Answer: There are two basic issues relative to the contract renewals. That is, (1) the right to alter the water supply to be made available to the contractor under the renewed water service contract; and (2) the extent of the environmental documentation which must be prepared for the contract renewals.

Both of these questions were answered by the November 10, 1988 Department of the Interior Solicitor's Opinion. In effect, that opinion stated that:

> a. The Secretary has no discretion as to water quantities in a renewal contract, as he is required to provide the same water quantities that were included in the existing contract, provided the contractor has satisfactorily performed all of the terms and conditions of the existing contracts, and
>
> b. The Secretary is not required to prepare an environmental impact statement or assessment concerning renewals of contracts that contain substantially the same terms and conditions as are contained in existing contracts, because such renewals constitute nondiscretionary action and do nothing more that retain the status quo.

At the present time, these positions are being challenged by the Environmental Protection Agency through referral to the Council of Environmental Quality and by various environmental groups through litigation (NRDC v. HOUSTON). The Department is continuing to support its position through these other avenues. It is expected that the Council of Environmental Quality will take some action on the referral in mid-June. Litigation of the substantive issues of the lawsuit have not yet started and an estimate of when the lawsuit will be completed cannot yet be made.

Question: Have you established procedures and schedules which will eliminate, to the extent possible, extended delays in renewing the expiring contracts?

Answer: We will be making every effort to expeditiously renew the expiring contracts. Negotiations with the other Friant Unit contractors had been necessarily delayed until the court order was issued allowing Interior to proceed. We can now move forward toward renewing the other contracts in accordance with the Department's basic policy and principles.

Negotiations will begin soon with the other Friant Unit contractors with contracts expiring in the near future. Since many of the contract issues were resolved in the negotiations with the Orange Cove Irrigation District, it is expected that the negotiation process with the other contractors will be expeditiously accomplished. All of these negotiations will, of course, be done in a public forum with full review and comments. The completed renewal contracts will be provided for public comment after negotiation, and the comments received will be fully evaluated and considered before any of the contracts are executed.

Budget Priorities

Question: Starting in FY 1988, the Administration has structured the budget of the Bureau of Reclamation in such a way that projects closest to completion have been given sufficient funding to remain on efficient engineering schedules. While good in theory, it has left the Congress the problem of finding funding for several projects strongly supported over the years, namely Garrison Diversion in North Dakota, the Animas-La Plata in New Mexico, and the North Loup project in Nebraska.

Each year the Congress has rejected the approach presented in the Administration's budget request. The FY 1990 budget request is again structured so that these same projects do not maintain the schedules envisioned by the Congress in action of the FY 1989 appropriations bill. Restoration of these projects to adequate levels would take in the neighborhood of $60 million.

Mr. Secretary, the President signed the FY 1989 Energy and Water Appropriations Bill and commended the Congress at that time for "keeping funding contained in this Act at acceptable levels.".

---In light of the fact that the President last year accepted the way the Congress had put the Reclamation budget together, why has the Reclamation budget been formulated in a way which has been rejected for the last two fiscal years?

Answer: The FY 1990 request is consistent with the request levels of prior years, which have for the large part been accepted by the Congress. The budget request for the projects you named is the result of hard decisions made by the Administration to remain within funding constraints.

Question: Can you suggest some middle ground on the Garrison, North Loup, Animas-La Plata projects, etcetera, where some meaningful progress could be made on those projects without doing damage to the budget?

Answer: There is a potential 1990 "middle ground" funding level that is plausible for the Garrison project. However, for the North Loup and Animas-La Plata projects, there is really no meaningful "middle ground" construction funding level between the President's 1990 budget request and an efficient schedule funding level.

The 1990 funding request for Garrison of $8.75 million provides for reasonable conclusion of ongoing work and protection of the investment. The Bureau would need an additional $39.4 million (a total of $48.2 million) in 1990 to fund the Garrison project on an efficient construction schedule. Funding at the FY 1989 level of $30 million would provide a reasonable, but somewhat inefficient, construction schedule in FY 1990.

Reclamation's 1990 budget requests $6.0 million for the North Loup project. No funding is included for Davis Creek Dam and related facilities. To put the North Loup project on an efficient schedule would require funding of $22.7 million in 1990, or an additional $16.7 million.

Reclamation's 1990 budget requests $3.7 million for the Animas-La Plata project. To put the project on a more efficient schedule would require an additional $6.8 million (total $10.5 million). The Bureau advises me that there is no "middle ground" for construction of this project.

As long as the overall level of funding for the FY 1990 Reclamation Appropriation is consistent with allocations pursuant to the Bipartisan Budget Agreement and resulting Budget Resolutions, we would have no objection to funding increases for these projects from a budgetary standpoint. However, all three of the projects mentioned have outyear costs that are very high. For example, the outyear costs for Animas are $113 million, and for Garrison, $1.4 billion. Increasing the amount appropriated for these projects in 1990 still would not guarantee efficient construction schedules for them beyond 1990, because the high outyear costs would compete with and potentially delay other construction programs currently underway.

Question: If the Congress again rejects the policy set out in the Administration's budget for the Bureau of Reclamation, would you be likely to put forth a budget which is more in line with what has actually been enacted into law for the past several years?

Answer: Except for constrained funding on the Garrison Diversion Unit and North Loup Division, the 1990 budget request provides funding for all projects on which actual construction was underway at a level that enables an efficient construction schedule. The funding for Garrison and North Loup was constrained because of uneconomic components and nonbudgetary reasons. If the Congress provides funds that alters the amount of completion and construction schedule for these projects, that will be considered as future budgets are developed and requests made to the Congress.

Loss of Coastal Wetlands

Question: Mr. Secretary, as you are probably aware, Louisiana has 40 percent of the U.S. coastal marshes and 80 percent of the annual losses of marsh land. In addition, this kind of wetland environment in Louisiana produces 30 percent of the U.S. fishery harvests, and the total economic impact related to wetland resources exceeds $1 billion.

With this in mind, what should the Federal role be in the protection and restoration of wetlands and control of coastal erosion?

Answer: Only recently has the magnitude and impact of coastal wetland loss been recognized as a serious resource management problem on our coasts and along our inland waterways. The Federal role includes helping to provide the information necessary to address these impacts with improved management approaches. The Federal government must ensure that activities funded and authorized by it do not contribute to further losses of coastal wetlands as well as being pro-active in restoring wetlands and in developing solutions to reduce losses. We must also establish the presumption that coastal wetlands, and interior wetlands, should be maintained to perpetuate the broad spectrum of public values and services they yield. It must be the responsibility of all interests to prove that a development proposal that destroys or degrades wetland functional values is in society's best interest. When it is, mitigation should be required to replace the lost societal values.

To exemplify the concern for coastal wetland issues, the Fish and Wildlife Service presented a detailed proposal to the National Ocean Pollution Policy Board regarding wetlands. The Policy Board's "Federal Plan for Ocean Pollution Research Development and Monitoring: Fiscal Years 1988-1992" identifies as opportunities for

Federal effort the production of a digital database of wetland map information for all of the coastal counties and to intensify a wetland status and trends study to determine coastal wetland losses and the reasons for those losses. In addition, the Federal Insurance Administration of the Federal Emergency Management Agency has contracted with the National Academy of Sciences to study the Nation's coastal erosion problem. Their report is scheduled to be completed in July 1989.

Question: Last fall, President Bush stated that he would set "as a "National goal, no net loss of wetlands". He further said "that wetland preservation should be a priority and should enjoy the same level of importance" as other water resource functions of the Federal government.

---Mr. Secretary is it realistic to think that the goals of "no net loss" of coastal wetlands is obtainable?

Answer: Considering the losses caused by natural processes along the Gulf coast, the costs would most likely be prohibitive to stop all loss of coastal wetlands. However, I think we can accomplish the President's "no net loss" goal for wetlands in general if we work to retard losses caused by natural processes and work to stop those losses caused by man's activities. It will require some tough actions on the part of government at Federal, State, and local levels.

Question: Can you give the committee a ball park estimate of what it would take dollar-wise to solve this problem?

Answer: Retarding losses being caused by natural processes and correcting past actions that are contributing to those losses may be costly, although I do not have a good basis for a cost estimate. However, stopping future losses because of human activities is feasible and may not prove to be as costly. It will require cooperation and some hard decisions by all levels of government and private landowners to truly achieve the "no net loss" policy. On the average, it costs about $100 to restore an acre of freshwater wetland. Costs for restoring coastal wetlands can run much higher.

Wetlands Policy

Question: What is the policy of the Administration regarding wetland protection and restoration? What, specifically, is the Administration prepared to do to help reverse the loss of important wetland resources?

Answer: The President has stated his concern for the continuing loss of wetlands in this Nation and has committed to establishing no net loss of wetlands as a national goal.

The Administration is establishing an inter-agency task force under the Domestic Policy Council to recommend ways to revise and strengthen the current Presidential executive order on wetland protection. The task force will also coordinate and assess implementation of the no net loss goal by Federal, State, and local governments and the private sector. Proposals are under review which would increase Interior's wetland restoration activities. Several proposals to strengthen our existing wetland protection programs are also under development.

Question: Are existing laws and regulation sufficient to preserve and enhance the wetland resources of the United States or do we need a new more comprehensive wetland policy? If changes are needed, what should be the goals and how should it be developed and implemented?

Answer: The President's interagency task force on wetlands will be addressing the adequacy of existing laws and regulations with regard to the preservation and enhancement of wetland resources. A more comprehensive wetland policy will emerge as well as changes in activities, emphasis and implementation. However, it is too soon to say what specifically should be changed and developed to implement the overall policy of "no-net-loss" of wetlands.

Question: How should competing interests of development and conservation (non-development) be addressed?

Answer: The current and historic rate of wetland losses makes it clear that balancing wetland development and conservation is difficult at best. Developing an approach that allows development while conserving wetland functions and values requires a change in perspective and philosophy more than new technological development; we have the technology to conserve wetland resources when we construct new development projects, we have not had the determination. Wetland resources provide a variety of functions that are recognized as being valuable to society. In the past, losses of these functions have been considered external to the economic expenditures associated with a project. A better balance between wetland development and conservation can be achieved by making certain that the costs of wetland degradation or destruction are included in any appraisal of a wetland development project. The costs of wetland degradation or destruction would include the price of replacing the services wetlands provide to society as well as the economic expenditures associated with not replacing those services. For example, the costs of development in a wetland that provided water storage and retention would include economic expenditures associated with flood damage and subsequent flood protection, decreases in water availability during drought and subsequent construction of water delivery systems. The costs of development in a coastal wetland might include damages from coastal erosion, degradation of coastal fisheries, losses of nursery areas, and any economic expenditures to replace these functions that had been provided without charge by the wetland.

There are existing mechanisms for considering these costs in public and private wetland development projects. However, these costs are not generally given full consideration or equal weight by project proponents, government regulators and decision-makers, or the general public. Existing mechanisms that regulate wetland development tend to favor economic gains associated with the development activity. Until this attitude changes, a better balance between wetland development and conservation is unlikely. Changing these attitudes will require a more complete realization of society's dependence on the services provided by wetland resources and a better balance between short-term economic gains versus long-term benefits.

Question: What do you see as the role of State and local interests?

Answer: They must be full partners in this effort.

Construction Schedules

Question: Does the budget request for FY 1990 improve the construction schedules envisioned by the 1989 appropriation? If so, could you tell us what those projects are, the amount which would have been requested in 1990 as a result of the 1989 appropriation, the additional amount added to improve the schedule, and a brief explanation as to why the money was added?

Answer: Yes, it does improve several, as we projected back during the FY 1988 budget request. For the record, here is a list showing previously delayed projects that are back on efficient construction schedules.

Improved Construction Schedules
($ in thousands)

Project	Planned for FY1990 a Year Ago	Planned in FY1990 Request	Increased Amount	Brief Explanation
Belle Fourche, P-SMBP	5,697	6,675	978	Resume efficient schedule.
Boulder Canyon	800	12,000	11,200	Resume schedule.
Colo.R Front Work & Levee	4,600	8,400	3,800	Resume schedule.
Leadville Mine Tunnel	950	4,550	3,600	Begin treatment plant.
Paradox Valley, CRBSCP	1,908	2,461	553	Resume schedule.
Grand Valley Unit, CRBSCP	7,824	8,239	415	Resume schedule.
CRBSCP, Title I Division	7,970	19,060	11,090	Resume schedule.
Dolores Project	26,801	41,146	4,345	Resume schedule.
WEB Rural Water	8,000	14,304	6,304	Complete in FY91.
CRSP Rec, Fish & Wildlife	14,058	28,271	14,213	Resume schedule.

Question: Similarly, several project schedules have been revised or delayed from that anticipated by action on the 1989 Appropriations bill. What are those projects, the amount included in the 1990 budget, and the additional amount needed to maintain the schedules anticipated in the 1989 Appropriations bill?

Answer: We no longer consider any construction projects delayed for budgetary reasons, except the two listed below:

Project	FY 1990 Request	Additional Needed
Garrison Diversion Unit, P-SMBP	8,750,000	39,250,000
North Loup Division, P-SMBP	6,030,000	16,710,000

The proposed Reagan budget for the Bureau of Reclamation was based on that Administration's support for the Bureau's priorities--

increased resources for the operation and maintenance of existing projects, and emphasis on the construction of projects that are substantially underway. In order to provide additional resources in these areas, it was necessary to reduce funding for some activities including those that are new or of lower priority.

The Bush Administration did not propose any specific changes to the January 9th Budget for this item. As long as the overall level of funding for Reclamation appropriations is consistent with allocations pursuant to the Bipartisan Budget Agreement and resulting Budget Resolutions, we would have no objections to this increase from a budgetary standpoint.

Operation and Maintenance Revolving Fund

Question: The budget request for 1990 includes a proposal to create a new Reclamation Operation and Maintenance Revolving Fund. Can you explain the need for such an account? How would this new account be managed? Why are current procedures in carrying out your O&M responsibilities inadequate?

Answer: The current process has created a situation where the Bureau's operation and maintenance program, rather than emphasizing scheduled preventive maintenance and replacement, is moving toward repair of facilities after breakdown occurs. Repair work performed after breakdown is more expensive than preventive maintenance. Further, the results of a breakdown are usually a loss of revenues and unanticipated adverse environmental impacts. Reclamation needs to ensure the operational dependability, integrity, and safety of Reclamation structures and facilities and to optimize revenues to the Treasury. A revolving fund would provide the flexibility and financial certainty needed for efficient operation of a business-like operation and maintenance program which is financed by the users, while at the same time assuring continued operational readiness and dependability of our water and power systems which are the foundation of continued economic stability and social well-being of the Reclamation service areas.

With respect to financial accountability, accounting practices of the Bureau of Reclamation would continue to require maintenance of income and disbursement records for each individual project and, in the case of multi-unit projects, for each individual unit. In addition, the budget for the revolving fund would be subject to review within the Executive Branch, and by the Congress during the annual budget process. This is the process that is currently used for the revolving fund programs for the Colorado River Storage Project and the Colorado River Basin Project.

Operation and Maintenance

Question: The Budget Appendix shows a funding request for operations and maintenance of $232.3 million offset by $138.2 million once the Revolving Fund legislation is transmitted to the Congress.

What is the actual appropriation request for Operation and Maintenance activities of the Bureau of Reclamation?

Answer: If the proposed Operation and Maintenance Revolving

Fund legislation is not enacted, the FY 1990 appropriation request is $232,287,000.

Question: What would be the appropriation request if legislation is transmitted to Congress?

Answer: If the legislation is transmitted to Congress and enacted prior to October 1, 1989, the appropriation request would be $134,086,000. This consists of $94,086,000 for operation and maintenance of the nonreimbursable activities and $40,000,000 to capitalize the revolving fund.

Operation and Maintenance Revolving Fund

Question: I understand that a legislative proposal has been under consideration and review for some months. What is the status of the legislation to create the revolving fund?

Answer: The draft legislation and related documents were developed jointly by the Bureau of Reclamation, the Bonneville Power Administration, and the Western Area Power Administration and are currently under review within the Executive Branch prior to submission to Congress.

Question: Have any problems been encountered within the power marketing and water community regarding this proposal? If so, what are the issues raised and what is being done to resolve those issues?

Answer: Both the water and power communities have expressed their support of the revolving fund. The National Water Resources Association passed a resolution in October, 1988, (Res. 89-22) in strong support of the fund. The Administrators of the Bonneville and Western Area Power Administrations have expressed their support and pledged to cooperate with Reclamation in establishing the fund. The only questions raised have dealt with management and accountability of the fund. We have advised the power interests that Reclamation will continue to maintain income and disbursement records for each individual project or unit of a project, and that the budget for the revolving fund will be submitted to the Department, the Office of Management and Budget, and the Congress during the annual budget review process. In addition, the water and power users will have an opportunity to provide input to the operation and maintenance program through the rate-making process.

Question: How do you view the chances for developing legislation in the Executive Branch which can be supported by all parties? Are you optimistic that once legislation is transmitted it can be enacted?

Answer: Since the legislation is being developed jointly with the power marketing administrations, and is supported by the project beneficiaries, we are optimistic that the legislation can be enacted.

Question: What would be the budgetary impact if the proposal for a Revolving Fund is not enacted?

Answer: The level of funding needed to support the O&M program if the revolving fund is not enacted is $232,287,000. If the legislation is transmitted to the Congress and enacted prior to October 1, 1989, the appropriation request would be $134,086,000, which consists of $94,086,000 for operation and maintenance of the nonreimbursable activities and $40,000,000 to capitalize the revolving fund.

General Investigations

Prematurely Concluded or Discontinued Fiscal Year 1989 Write-Ins

Question: Are you prematurely concluding or discontinuing any studies added to the General Investigations Program by the Congress in fiscal year 1989? Which ones?

Answer: Yes. In 1989 Congress added funding for 7 planning studies not requested in the President's budget. Four studies - Offstream Storage (CA), Prairie Bend Unit (NB), Gregory County (SD), and Ninnescah River (KS) were sufficiently funded to complete them in 1989. The Eastern New Mexico Water Supply Study, Alamogordo Municipal and Industrial Water Supply Project and the San Bernardino Valley Water Management Study (now called the Santa Ana Watershed Management Study) will be discontinued or prematurely concluded during FY 1989.

Question: Which of these studies still have a sponsor willing to cost share in them in fiscal year 1990?

Answer: All three studies have sponsors willing to cost share in fiscal year 1990.

Question: For each such study that you propose to terminate, please explain your specific reasons for doing so.

Answer: It is proposed to conclude or discontinue these three studies because of budget constraints and because these studies are not consistent with Reclamation's new direction and limited planning resources. Concluding or discontinuing these studies will allow more efficient and effective use of the planning resources available within the Bureau.

Trace Element Toxic Constituent Program

Question: You are proposing a trace element toxic constituent program in the general investigation appropriation. Why have you proposed this work for inclusion in the general investigation program rather than in the PRESS program, since it appears to be basically a research thrust?

Answer: The trace element/toxic constituent program was instituted in order to perform field studies to accumulate data and make determinations regarding sources of contamination, mechanisms of mobilization, and pathways of movement of trace elements in specific project areas (either new project investigations or operating projects). Very little of what is to be done falls in the area of research since we are not investigating new or unknown phenomena or processes. These phenomena or processes have been, and continue to be, researched intensively by universities and similar entities with the result that sufficient information is available to us to apply their results to practical situations. Rather, we are conducting field studies to apply this research to determine how understood basic processes are operating on specific projects or will operate under future project operation.

Construction Projects Completion Dates

Question: Please report all projects completing in FY 1989 and FY 1990. Please report all changes in project completion year estimates from last year's submittal. Explain the reason for the change, including noting whether the project cost increased as a result of the change.

Answer: The projects that are being completed in FY 1989 and FY 1990 are listed below.

FY 1989

San Felipe Division,

Central Valley Project

Yakima Fish Passage and Protective Facilities

Seedskadee Project (SOD)
Bostwick Division, P-SMBP

Colorado-Big Thompson Project

Crow Creek Pumping Unit, P-SMBP

Lower Colorado Water Supply Project

Nueces River Project

Palmetto Bend Project

FY 1990

Grand Coulee Third Powerplant

WEB Rural Water Development Project

Foss Dam, Washita Project (SOD)

All-American Canal Project
Brantley Project

Glendo Unit, P-SMBP

McGee Creek Project

Weber Basin Project

Jensen Unit, Central Utah Project

The completion date of three construction projects was delayed while various segments of the Central Arizona Project were modified. The completion date for the Belle Fourche Unit was adjusted from 1991 to 1994 in order to reflect completion of the entire authorized project. Buffalo Bill Dam Modification slipped from 1991 to 1992 due to increased work requirements which caused an increase in project cost. The cost to complete the Closed Basin Divison of the San Luis Valley Project increased and required new authorization to increase the appropriation ceiling in order to complete the project. Fiscal constraints and the delay in acquiring the new appropriation ceiling caused a one year slippage in the project's completion. The project received increased ceiling with the passage of Public Law 100-516 on October 24, 1988.

On the Central Arizona Project, water delivery was delayed to the City of Prescott due to a need to continue the study of the Verde

River water exchange, to the HoHoKam IDD due to delayed design completion, and to the Central Arizona and Maricopa-Stanfield Irrigations Districts due to protracted negotiations of the drainage and minor construction contracts. Delivery of water to the City of Tucson was accelerated by one year due to favorable contractor progress.

Boulder Canyon Project

Question: Last year the Committee noted the great risk to public safety due to existing traffic and pedestrian patterns at Hoover Dam and urged Reclamation to move forward with the visitors center and bridge crossing projects as quickly as possible. How have you progressed on these projects? Does your FY 1990 request represent your full capability on those projects?

Answer: The work at Hoover Dam to resolve traffic and pedestrian safety problems is proceeding on an excellent schedule based on funding available in FY 1989. The program request for FY 1990 will be sufficient to continue our current schedule.

The Colorado River Bridge Crossing cost-sharing negotiations with the States of Arizona and Nevada and the Federal Highway Administration are presently in progress. Both States have received copies of the draft cost-sharing agreement and are currently reviewing them. We anticipate adequate participative funding from these other sources in FY 1990, and are not directly requesting funds for the Bureau. The Federal and State cooperation in this project during FY 1990 should meet our needs for all pre-construction activities.

Mni Wiconi Project

Question: Last year Congress authorized construction of the Mni Wiconi Project in South Dakota (P.L. 100-516). If Federal funding were to be provided for this project, what is your estimate of capability and for what would the funds be used?

Answer: The FY 1990 capability is $1 million and would be used for preconstruction work including completion of the engineering report, NEPA compliance work, and design and specifications.

The proposed Reagan budget for the Bureau of Reclamation was based on that Administration's support for the Bureau's priorities--increased resources for the operation and maintenance of existing projects, and emphasis on the construction of projects that are substantially underway. In order to provide additional resources in these areas, it was necessary to reduce funding for some activities including those that are new or of lower priority. As a result, the Reagan budget did not include any funds for the Mni Wiconi project.

The Bush Administration did not propose any specific changes to the January 9th Budget for this item. As long as the overall level of funding for Reclamation appropriations is consistent with allocations pursuant to the Bipartisan Budget Agreement and resulting Budget Resolutions, we would have no objections to this increase from a budgetary standpoint.

Auburn Dam

Question: Last year we directed the Corps of Engineers to study a "dry" dam alternative at the Auburn Dam site. The American River Authority has now presented a proposal to fund up to $700 million for the original full-service dam. What is Reclamation's current position on how this project should proceed?

Answer: Reclamation believes that any dam that is constructed on the American River above Folsom Reservoir must provide the necessary flood control to meet the needs of the City and County of Sacramento. Reclamation is willing to evaluate cost sharing proposals from non-Federal entities that would supply the necessary funding to construct a multi-purpose project that would provide benefits beyond flood control. The American River Authority proposal is being seriously evaluated.

San Felipe Division, CVP

Question: It was the Committee's understanding that the San Felipe Division would be completed in fiscal year 1989 except for the Watsonville subarea. The Bureau is requesting $2.5 million in FY 1990. What will these funds be used for? When will the project be completed? What has the Bureau done with the $100,000 appropriated to study the feasibility of the Watsonville subarea?

Answer: Transfer stipulations required that cathodic protection be done on Hollister Conduit. The contract was awarded in FY 1989 but will be completed in FY 1990 for which $300,000 has been programmed. The remaining $2,200,000 has been programmed for repair of the seepage problem now occurring at San Justo Dam and Reservoir. If no further seepage problems occur, we anticipate completion of all major facilities, with the exception of the Watsonville subarea, in FY 1990.

Preliminary alternatives for the Watsonville subarea are being studied and a ground water model is being developed.

Indian Water Rights Settlement Projects

Question: Will the Southern Arizona Water Rights Settlement Act required date for delivery of water to the Tohono O'Odham be met with the construction funding requested for FY 1990 under the Indian Water Rights Settlement Project?

Answer: We are confident that the $6 million FY 1990 request for construction is adequate to meet the October 12, 1992 deadline for delivering water to the tribe.

Question: We see that the total Federal obligations required for the Buffalo Bill Dam modifications project exceed the authorized appropriation ceiling. What is the cause of this? When will you formally request an increase in the ceiling? What impact will this have on financial arrangements with the State of Wyoming?

Answer: The 1982 Project Authorization Cost Estimate was based on feasibility estimates in 1972. Since the authorization, the project has been changed because of conditions encountered at the site and improved by design. Changes began in 1983 when the inflow design flood was increased as a result of improved flood forecasting. This required raising the height of the Diamond Creek Dike by 15 feet, modifying the crest of Buffalo Bill Dam, and modifying the base of Buffalo Bill Dam. Other changes included moving the powerplant downstream 4,000 feet to a safer, more accessible site for construction, pressurizing the existing Shoshone Canyon conduit, adding a 3 megawatt generating unit to the existing Shoshone Powerplant, and constructing a bridge for access to the relocated powerplant. These changes resulted in cost increases. This change also resulted in increased power generation, a safer project, and better capability to meet instream flow requirements. Another change was to rehabilitate the lower level river outlets. A low-level outlet was required to alleviate a potentially serious hydrogen sulfide problem in the reservoir. Cost overruns have also been experienced in relocation of existing State-owned recreation facilities and relocation of county roads along the reservoir. The necessity for protection of the Cody Canal was initially foreseen, but was not included in the original project cost estimate.

This increase will not affect the total amount to be contributed by the State of Wyoming. The agreement between the State and the Bureau only commits the State to a total contribution of $47 million. However, an increase in the total cost of the project means the State's contribution will be a smaller percentage share which will reduce their share of project revenues. The State legisature had passed a bill increasing their contribution by $5 million to assist in funding additional project work. The President's FY 1990 budget does not propose that the ceiling be increased.

Groundwater Recharge Demonstration Program

Question: Earlier you notified the Committee that the sponsors of three projects in the Groundwater Recharge Demonstration Program had withdrawn. Have you successfully replaced the projects that dropped out of the program? How will this change in plans affect the cost and completion date for the program?

Answer: The replacement project selection process is well advanced. All sponsors of unselected projects from the Phase I Report to Congress have been contacted. Most have indicated they still wish to be considered. We are currently reanalyzing and preparing an environmental evaluation on each project. Reclamation will make its recommendations in June and recommendations will be made to the Congress shortly thereafter. Funds to initiate the three replacement projects in FY1990, along with other projects not started in FY1989, are included in the FY1990 budget request. Thus, the completion date of the program will not change.

North Loup Division, P-SMBP

Question: What will the status of construction on the Davis Creek Dam and related facilities of the North Loup Division be at the end of FY 1989? What would be the estimated cost for terminating work at that point in time? What is your capability on this project?

Answer: By the end of FY 1989 construction on Davis Creek Dam and related facilities will be about 23 percent complete. Currently, only construction of the dam is underway and it will be about 50 percent complete at the end of FY 1989. Design data collection and design work is underway on the distribution system.

The FY 1990 funding request does not include any amounts to settle contractors' claims for facilities already constructed or for anticipated claims associated with the termination of the Davis Creek Dam construction contract. There is an unsettled contractor's claim of $3,400,000 for work involving construction of Mirdan Canal, First Section, and we estimate that claims of $5 million or more could result from terminating the Davis Creek Dam construction contract at the end of FY 1989. Additional costs of up to $3 million could be expected to terminate employees working at the project office and to clean up, secure, and stablize the construction site.

The Bureau has additional capability of $16,710,000 in FY 1990. Funds would be used to continue construction of Davis Creek Dam, award a contract for construction of the Fullerton/Elba System in February 1990, and initiate rights-of-way acquisition and design of the Fullerton 2 and 3 System.

The proposed Reagan budget for the Bureau of Reclamation was based on that Administration's support for the Bureau's priorities--increased resources for the operation and maintenance of existing projects, and emphasis on the construction of projects that are substantially underway. In order to provide additional resources in these areas, it was necessary to reduce funding for some activities including those that are new or of lower priority. As a result, the Reagan budget included $6,030,000 for the North Loup project.

The Bush Administration did not propose any specific changes to the January 9th Budget for this item. As long as the overall level of funding for Reclamation appropriations is consistent with allocations pursuant to the Bipartisan Budget Agreement and resulting Budget Resolutions, we would have no objections to this increase from a budgetary standpoint.

Animas-La Plata Project

Question: Why was the decision made to defer indefinitely the Animas-La Plata project now that legislation has been enacted settling tribal water rights claims? What is your capability in FY 1990 to start construction on this project?

Answer: The decision is in accord with current policy to concentrate limited financial resources on projects which are well underway and from which benefits can be made available in a timely manner. In FY 1990, we can use a total of $10.5 million of Federal funds along with $4.9 million of non-Federal funds for a total program of $15.4 million. I am sure the Department and OMB will review continuing the indefinite deferral in FY 1991.

The proposed Reagan budget for the Bureau of Reclamation was based on that Administration's support for the Bureau's new priorities--increased resources for the operation and maintenance of existing projects, and emphasis on the construction of projects that are substantially underway. In order to provide additional resources in these areas, it was necessary to reduce funding for some activities including those that are new or of lower priority. As a result, the Reagan budget included $3,727,000 for the Animas-La Plata Project.

The Bush Administration did not propose any specific changes to the January 9th Budget for this item. As long as the overall level of funding for Reclamation appropriations is consistent with allocations pursuant to the Bipartisan Budget Agreement and resulting Budget Resolutions, we would have no objections to this increase from a budgetary standpoint.

Garrison Diversion Unit, P-SMBP

Question: What is the rationale for stopping the Garrison Diversion Unit at this point in time after the years of effort to have it reformulated? What capability does Reclamation have on the Garrison Diversion Unit in FY 1990?

Answer: The restricted funding for Garrison is consistent with the Administration's policy of concentrating limited financial resources on completion of Reclamation projects substantially underway in order that the benefits become available as soon as possible. The Bureau has a total Federal capability of $48.2 million on Garrison in FY 1990. This includes continued construction of Reach 2 of New Rockford Canal and recreation facilities throughout the Project. Also included is funding for the State and Indian municipal, rural, and industrial water programs and continued purchase and development of fish and wildlife lands to achieve concurrency. Further work would continue on O&M of existing and partially completed facilities and preconstruction activities on other features of the Project. Work would begin on Indian irrigation facilities.

The proposed Reagan budget for the Bureau of Reclamation was based on that Administration's support for the Bureau's priorities--increased resources for the operation and maintenance of existing projects, and emphasis on the construction of projects that are substantially underway. In order to provide additional resources in these areas, it was necessary to reduce funding for some activities including those that are new or of lower priority. As a result, the Reagan budget included $8,750,000 for the Garrison Diversion Unit.

The Bush Administration did not propose any specific changes to the January 9th Budget for this item. As long as the overall level of funding with Reclamation appropriations is consistent with allocations pursuant to the Bipartisan Budget Agreement and resulting Budget Resolutions, we would have no objections to this increase from a budgetary standpoint.

Construction New Starts

Question: As we understood it the Department's original policy regarding prioritizing funds in the construction program envisioned having resources available for new starts once some on-going projects are completed and the others are funded on efficient construction schedules and that this would happen about FY 1991 or 1992. When does the Administration now anticipate having funds available for construction new starts in the Bureau of Reclamation?

Answer: Your understanding is correct. The position given at the time of the FY 1988 Justifications was that after FY 1990, the Bureau's Construction Program could continue effectively with about $650 million per year at October 1987 price levels. Once the "funding hump" was met in FY 1989 and 1990, new projects could begin in FY 1992. This is still true, the way the Construction Program budget is structured.

Coolidge Dam

Question: What was the result of Reclamation's Coolidge Dam Modification Study? Is either Reclamation or BIA requesting the SOD funds needed to correct deficiencies at this dam?

Answer: The draft report indicates that Coolidge Dam will require major modifications to ensure its safety. The recommended modifications include replacement of the spillway chutes, installing a post-tensioned abutment stabilization system and providing an overtopping concrete protective slab for the areas of the abutments not protected by the post-tensioned abutment stabilization system. Due to the possibility of failure of the left abutment under normal operating conditions, interim measures were also recommended. The interim recommendations include: restricting the reservoir to a maximum elevation of 2500 feet, expansions of the existing monitoring program, and installation of an early warning system. Until an early warning system is installed, the dam is to be attended on a 24 hour a day basis whenever the reservoir surface elevation exceeds 2460 feet. Neither Reclamation nor BIA requested funding in FY 1990 but the Secretary has taken action to make $1.9 million available for needed preconstruction work in FY 1989 and FY 1990. Since the FY 1990 budget request was submitted, Reclamation has been named the lead agency for this work.

Umatilla Project Capability

Question: What is your capability to begin construction on the recently authorized Umatilla Basin Project in FY 1990? Won't delaying the start of this project jeopardize the efforts of the Confederated Tribes of the Umatilla Indian Reservation and the State of Oregon to restore salmon and steelhead populations in the Umatilla River?

Answer: Federal funds in the amount of $1,300,000 could be utilized in fiscal year 1990 to complete designs, acquire right-of-way and initiate construction on the project's first phase, which is West Extension Irrigation District (WEID) water exchange facilities, complete predesign activities on the remainder of the project, design hydromet facilities and initiate streamflow monitoring activities. This would enable the WEID water exchange to be in place as early as the fall of 1991. The WEID facilities would provide water to the irrigation district from the Columbia River in lieu of water now diverted from the Umatilla River at Three Mile Diversion Dam. This would improve flow conditions from the mouth of the Umatilla River upstream to the diversion dam, which together with the recently implemented passage and channel improvements funded by non-federal entities, would remove a critical barrier to fishery restoration.

Salmon and steelhead are returning to the mouth of the Umatilla River in increasing numbers as a result of fish planting programs that have been implemented by the Confederated Tribes of the Umatilla Indian Reservation and the State of Oregon. Without adequate streamflow in the Umatilla River, these fish will be unable to migrate upstream beyond the river mouth. A delay in implemention could increase tensions among competing water users.

The proposed Reagan budget for the Bureau of Reclamation was based on that Administration's support for the Bureau's priorities--increased resources for the operation and maintenance of existing projects, and emphasis on the construction of projects that are substantially underway. In order to provide additional resources in these areas, it was necessary to reduce funding for some activities including those that are new or of lower priority. As a result, the Reagan budget did not include any funds for the Umatilla Basin Project.

The Bush Administration did not propose any specific changes to the January 9th Budget for this item. As long as the overall level of funding for Reclamation appropriations is consistent with allocations pursuant to the Bipartisan Budget Agreement and resulting Budget Resolutions, we would have no objections to this increase from a budgetary standpoint.

Verde River

Question: What is the status of studies to determine and identify solutions to flood control problems on the Verde River? How has the outcome of these studies been coordinated with your proposal to start SOD work on Horseshoe and Bartlett Dams?

Answer: The flood control replacement studies began in the fall of 1987. By mid-1988 indications were that the flood control options being studied would not be economically justified. Based on the preliminary indications available in mid-1988, the Bureau decided to continue the SOD studies under the assumption that flood control would not prove economically justified. In November 1988 the Bureau reported to local sponsors that the flood control options for adding new space were not justified and the Bureau had no authority to pursue other options. Subsequently, a new operational concept was developed that might justify additional flood control space at Bartlett Dam. However, at this time the Bureau is still pursuing the SOD studies under the assumption that flood control will not prove justified. The Bureau expects to complete the flood control studies in a timeframe that will not impact the construction schedule for SOD at Horseshoe and Bartlett Dams.

Recreational and Fish and Wildlife Facilities

Question: Public Law 100-563 states that "of the amounts appropriated hereafter under Section 8 of such Act, the first $15,000,000 shall be paid to the Association" as compensation for lands transferred from the Strawberry Valley Water Users Association. What does Reclamation plan to do with respect to this directive and what impact will it have on the Colorado River Storage Project Section 8 program?

Answer: Public Law 100-563 was passed on October 31, 1988. This was late in the fiscal year 1990 budget development process. The requirements of the act were recognized by the note on page 375 of the Bureau's FY 1990 budget submission to the Congress. Reclamation will comply with Public Law 100-563 by making the $15 million payment to the Strawberry Water Users. This will delay planned Section 8 work on other parts of the project.

Operations and Maintenance Revolving Fund

Question: When will you submit authorizing legislation for the O&M revolving fund you are proposing?

Answer: The draft legislation and related documents are currently under review within the Executive Branch. Upon completion of this review, the Administration will transmit the legislation and related documents to the Congress. We are hoping to submit the proposed legislation in the spring.

Question: What is the basis for your estimate that you need $40 million to initiate the revolving fund? Will the fund require a continuing appropriation after FY 1990? Is the fund paying for any non-reimbursable O&M costs?

Answer: The one-time appropriation of $40 million represents the amount needed to capitalize the O&M Revolving Fund (reimbursable O&M) work for the first quarter of FY 1990, until sufficient revenues are collected to allow the program to function on a self-sustaining basis. This amount was based on an estimate of approximately 25 percent of the scheduled reimbursable work for the fiscal year, plus a component for contingencies. No continuing appropriations for reimbursable work are anticipated following capitalization of the Revolving Fund in FY 1990. Under this proposal, however, all non-reimbursable O&M work will continue to be funded through the existing Operation and Maintenance account, financed by appropriations from the Reclamation Fund.

Question: What oversight will the Congress have over the amount expended on reimbursable O&M by Reclamation under your proposal? What management controls will you institute to ensure the fund operates efficiently and free of waste, fraud, and abuse?

Answer: The budget for the proposed revolving fund will be submitted to the Congress for review during the annual budget process, as are the existing revolving fund programs for the Colorado River Storage Project and the Colorado River Basin Project, providing the opportunity for Congressional overview.

With respect to financial accountability, accounting practices of Reclamation require maintenance of income and disbursement records for each individual project and for each unit of multi-unit projects. These records provide assurance that repayment of all project capital and O&M costs will be made by the appropriate project beneficiaries in the amounts and within the time required by repayment contracts. With respect to budgeting practices, management and priorities, we are working with the Bonneville Power Administration and the Western Area Power Administration to establish procedures to ensure that these issues are adequately addressed, and a Memorandum of Agreement will be executed to formalize the process. Reclamation will manage its power O&M program to meet the budget, audit, accounting, repayment, and resource planning needs of Reclamation, Bonneville, and Western. In addition, water and power customers will have an opportunity to provide input to the O&M program through the ratemaking process.

Question: What level of funding would be needed to support the O&M program as planned should the revolving fund fail to be enacted?

Answer: The level of funding that would be needed to support the O&M program if the revolving fund is not enacted is $232,287,000.

Disaster Assistance Act

Question: What has Reclamation done to implement its responsibilities under the Disaster Assistance Act of 1988? What else needs to be done?

Answer: Under existing authorities, Reclamation is evaluating the snowpack, precipitation patterns, and anticipated reservoir storage for the 1989 water delivery season. As estimates are made, information is being provided on our anticipated ability to deliver water and identification of where shortages are anticipated.

Actions that require appropriate National Environmental Policy Act compliance have been identified. Regulations have been issued to implement this Act, and approval has been received from the Office of Management and Budget for information collection from the public. Program management has been established to ensure compliance with the Act in terms of program accomplishment and the preparation of the report to the President and the Congress.

Under the authority of the Disaster Assistance Act of 1988 and our existing authorities, Reclamation will be able to assist in mitigating the effects of the current drought in the following areas (these are being funded with existing appropriations to the maximum amount possible):

a. A limited number of studies have been initiated. These studies are designed to identify potential water supplies that might be made available during the 1989 water delivery season. Examples of these studies include:

A contingency plan for short-term water leasing for private irrigators with junior water rights; this includes hydrologic investigations and development of standardized agreements for short-term water leases.

Development of a scheduling agreement that has allowed all water users to receive an ample water supply without conflicts between senior and junior water right holders.

A study to identify potential methods to increase the water supply through savings and economy of operations.

Working with a specific state, Reclamation has established rules and institutional arrangements for a Water Bank.

A study of installation of water measuring equipment to allow improved operational management of water deliveries and to provide a more equitable apportionment of the existing water supplies among all district water users.

A study of all Reclamation outlet facilities to determine the methods and feasibility of utilizing dead storage.

b. Assist willing buyers in the purchase of available water from willing sellers.

c. Contract for available water and capacity at Federal projects.

d. Identify additional activities, administrative procedures, or policies that should be included in upcoming budget requests.

e. Preparation of the report to the President and the Congress (due in March 1990) that will identify activities, administrative procedures and policies, and additional legislative authorities. The report will focus on means to allow Reclamation to respond to the next drought in a more effective, efficient, and timely manner.

As we explained in our March 17, 1989 letter to you, Reclamation will not be able to accommodate the following activities that are authorized under the Act:

a. Undertake construction, management, or conservation activities.

b. Make emergency loans to entities for management, conservation activities, or the acquisition and transportation of water.

Operation and Maintenance Program

Question: What new projects will be entering the O&M program in FY 1989 and FY 1990? What are the costs associated with these new projects? Will any facilities be removed from Reclamation's O&M program in FY 1989 or FY 1990? What are the costs associated with these facilities?

Answer: In FY 1989, the following new projects and costs will be entering the O&M program:

Owyhee Project - Idaho/Oregon	$ 450,000
Deschutes Project - Oregon	41,000
Vale Project - Oregon	220,000
FY 1989 Total	$ 711,000

In FY 1990, the following new projects and costs will be entering the O&M program:

Examination of System Operations - various states	$ 95,000
Public Safety (Reclamation Facilities) - various states	4,375,000
Dolores Project (UCRBF) - Colorado	57,000
FY 1990 Total	$4,527,000

In FY 1989, the following projects will be removed from O&M:

Boulder Canyon - Arizona/California/Nevada	$ 731,000
Mancos - Colorado	59,000
FY 1989 Total	$ 790,000

Question: The FY 1990 request represents a significant increase from the FY 1989 amount, which itself was significantly increased over the FY 1988 amount. Will there be further increases if you continue the initiative to catchup deferred maintenance as planned? How much of the FY 1990 request will go to the catchup program?

Answer: ~~Yes.~~ The FY 1990 O&M program includes $47 million for backlog maintenance items. Of this amount, $25 million is required to continue backlog maintenance started in FY 1989.

Examination of System Operations

Question: What work is proposed for the new initiative, "Examination of Systems Operations"? How does this differ programmatically from what appears to be similar work done under the General Investigations program? Will you cost share this work with non-Federal entities?

Answer: The primary focus will be on water conservation and improved hydropower production through improved water management practices and revised policy and guidelines. This program is closely tied to the "new direction" of Reclamation. It is also consistent with the Department's 10-point agenda for stewardship of natural resources.

There are two objectives of this program:

a. Implement automatic operation practices, utilizing available real-time hydrological, meteorological, and agriculture data in those areas where the highest payback is the most assured. Improved operating rules based on the use of real-time data will improve hydropower production in times of high water and mitigation of drought effects during times of low flow. Three target areas are envisioned, namely; (a) scheduling Reclamation deliveries to project facilities; (b) project schedules and deliveries to individual farms; and (c) on-farm cropping, land development, and irrigation practices.

b. Revision of policy and guidelines to encourage water conservation through the exchange or transfer of water rights and usage between willing parties. Such encouragement will strive for a proper balance between sufficient incentives and protection against unreasonable profit taking. Likely, a combination of Federal and State policy revisions will be required to assure success. These policy and guidelines will recognize the need for improved in-stream flow management for recreational, fishery, and other environmental purposes.

The General Investigations program and this program are complimentary. The General Investigations efforts will focus on identifying needs and users for conserved water. It will also identify benefits from future use to compare with costs to implement. Means to finance (cost sharing) the implementation would also be established during the General Investigations efforts. Cost sharing with project beneficiaries will be aggressively pursued in those activities dealing with project and on-farm work.

Public Safety

Question: What evidence do you have that points to the need for a new initiative on public safety? What is your estimate of the total cost of this program, and how long will it take to complete? Will any of this work be reimbursed by project sponsors?

Answer: Personal safety has always been a vital concern of the Bureau of Reclamation, and there has always been a strong mandate to protect the general public at Reclamation-owned facilities. Many of Reclamation's facilities were constructed in remote areas, not easily accessible to the public and therefore did not pose a safety problem. As the population of the West grew and urban areas expanded into the areas under Reclamation jurisdiction, these facilities began to pose potential hazards to the public. To minimize these hazards, Reclamation proposed to evaluate all its facilities and provide safety protection wherever necessary.

The FY 1990 request is $4.375 million and the program is being considered for combination with the public access program for subsequent fiscal years.

Initial installation work is nonreimbursable; thereafter, work is considered normal O&M and the costs are paid by the users.

Departmental Irrigation Drainage Program

Question: Please be more specific about why you are reducing the Department's Irrigation Drainage Program by $400,000 in FY 1990. Isn't this the type of work supported by the new direction of the Bureau of Reclamation?

Answer: The proposed reduction in Reclamation's portion of the Departmental Irrigation Drainage Program does not represent a reduction in the Department's commitment to the program. Rather, it represents completion of a number of studies and a consequent reduction in the number of studies remaining to be undertaken.

The Irrigation Drainage Program is conducted in five phases. These are site identification, reconnaissance investigations, detailed studies, planning of remedial action, and remediation. The peak of the workload for the first three phases is occurring in FY 1989. Planning of remedial action on the first four sites, other than the Kesterson Reservoir and San Joaquin Valley areas, is scheduled to begin in FY 1991.

We anticipate that funding requirements for site identification, reconnaissance investigations, and detailed studies will continue to decline beyond FY 1990 and that funding requirements for planning of remedial action and remediation activities will increase in future years.

This type of work is consistent with the new direction of the Bureau of Reclamation since the drainage contaminant data obtained as the result of the Departmental program will be used for identifying and resolving drainage-related problems in areas not covered by the study.

Loan Program

Question: Please provide a list of all loan applications received by Reclamation, the amount of the loan, the potential borrower, and the anticipated date the application will be reviewed and approved by Reclamation.

Answer: The following is a list of loan applications received by Reclamation. The anticipated Reclamation approval dates shown assume that eligibility criteria have been met.

Loan Applications

Loan Applications Received	Amount of Loan (millions)	Organization (owner)	Anticipated Approval Date
Middle Creek Dam Rehabilitation	3.0	State of MT	Approved
San Sevaine Creek Dam	27.7	San Bernardino, CA	10/89
Schuk Toak Indian Dist. System (Settlement Act)	8.4	Tohono O'odham Indian Nation, AZ	10/89
Dalles Project	2.0	Dalles Irrigation District, ID	10/89
Central San Joaquin	19.0	Central San Joaquin Irrigation District, CA	1/90
Thirty Mile Canal R&B Project	1.0	Thirty Mile Canal Irrigation District, NE	2/90
Leupp Water Project	26.2	Navajo Indian Nation, AZ	9/92
Narrows	26.2	San Pete Irrigation District, UT	6/91
North Cache	26.0	North Cache Irrigation District, ID	12/90

Question: Please explain the credit reform proposal and its impact on Reclamation's loan programs. How is the "non-subsidy" part of the loan financed in advance of the sale of the loan?

Answer: A Federal Credit Direct Loan Revolving Fund would be established in the Department of the Treasury. This Fund would finance the non-subsidized portion of the loan. The subsidized portion of the loan would continue to be appropriated from the general Treasury to the Bureau of Reclamation under Loan Program authority. The amount appropriated to Reclamation would be transferred to the Direct Loan

Revolving Fund, matched with the non-subsidized portion, and the total loan would be disbursed to the borrower from that Fund.

Under the credit reform proposal, Congress would appropriate the subsidy inherent in the credit programs, thereby allocating resources on an equivalent basis among credit programs and other government spending. However, the legislation is currently under review within the Administration and has not been submitted to the Congress.

Status of Reclamation Reorganization

Question: What is the status of the Reclamation reorganization called for in the "Implementation Plan"? Are there further changes in the works? What was the cost of implementing the reorganization? What are the cost savings from the reorganization?

Answer: Of the nine key recommendations presented in the "Implementation Plan," six have been fully implemented. The reorganization has been fully accomplished and the Denver Office is functioning in accordance with the plan. We are continuing to refine organizational processes and make adjustments to streamline operations. We do not plan any additional major organizational changes at this time.

Approximately $5.8 million was obligated for one-time costs associated with implementing the reorganization. This included costs such as severance and outplacement, sale and purchase of real estate, and building modifications. The $5.8 million was financed entirely by the General Administrative Expense (GAE) appropriation. In addition, Reclamation spent about $0.5 million from GAE on preliminary planning activities prior to the actual implementation phase of the reorganization.

We currently estimate FY 1989 obligations of about $1.0 million to complete activities associated with the reorganization, resulting in a total implementation cost of $6.8 million. This amount is about $2.8 million less than our original estimate of $9.6 million.

The annual savings from the reorganization are approximately $7.5 million. These savings are due to reduced salary and space costs from the Washington/Denver Office consolidation and closure of the Southwest Regional Office. Of the $7.5 million, $6.0 million will apply to the GAE appropriation and the remaining $1.5 million will apply to other appropriations such as Construction, Operation and Maintenance, and General Investigations. The GAE appropriation request for FY 1990 reflects this $6.0 million in savings.

Working Capital Fund

Question: How much has been appropriated to the WCF for the consolidated administrative systems of the Department through FY 1989, and how much more will be needed after FY 1990?

Answer: Funds of $4 million were first appropriated to the Working Capital Fund in FY 1989 for the consolidated administrative systems of the Department. Our budget for FY 1990 contains a request for an additional $7.1 million for the second year of funding the consolidated administrative system and $1.9 million will be needed after FY 1990.

Question: How much revenue does the WCF estimate collecting in FY 1990 from Reclamation and from other Federal agencies?

Answer: Reclamation is estimating $86.6 million in revenues to the Working Capital Fund in FY 1990. Of this $66.5 million will be collected from Reclamation and $20.1 million will be from other Federal agencies.

Question: Did the fund have any retained earnings from FY 1988 to FY 1989?

Answer: At the end of FY 1988, the fund had an unobligated balance of $13.6 million. This amount is expected to be reduced to $6 million at the end of FY 1989.

Bureau Capabilities

Question: Provide for the record a tabulation which shows the Bureau's individual funding capabilities for all planning studies, operation and maintenance, loans, and construction projects for fiscal year 1990.

Answer: The proposed Reagan budget for the Bureau of Reclamation was based on that Administration's support for the Bureau's priorities--increased resources for the operation and maintenance of existing projects, and emphasis on the construction of projects, and emphasis on the construction of projects that are substantially underway. In order to provide additional resources in these areas, it was necessary to reduce funding for some activities including those that are new or of lower priority.

The Bush Administration did not propose any specific changes to the January 9th Budget for this item. As long as the overall level of funding for Reclamation appropriations is consistent with allocations pursuant to the Bipartisan Budget Agreement and resulting Budget Resolutions, we would have no objections to these increases from a budgetary standpoint.

Attached for the record are the Bureau's project capabilities for fiscal year 1990.

(The information follows:)

BUREAU OF RECLAMATION

Additional Capability for Projects in the FY 1990 Budget
(dollars in thousands)

Appropriation/Project	Fiscal Year 1990 Request			Capabilities Submitted			Total Capabilities		
	Federal	Non-Fed	Total	Federal	Non-Fed	Total	Federal	Non-Fed	Total
CONSTRUCTION									
Regular Construction									
Animas-La Plata	3,727	773	4,500	6,773	4,127	10,900	10,500	4,900	15,400
Garrison Div. Unit, P-SMBP	8,750	510	9,260	39,400	4,200	43,600	48,150	4,710	52,860
North Loup Div., P-SMBP	6,030	820	6,850	16,710	0	16,710	22,740	820	23,560
WEB Rural Water Dev. Proj.	14,304	2,000	16,304	1,855	0	1,855	16,159	2,000	18,159
Recreational & F&W Fac. Various	28,271	0	28,271	15,600	0	15,600	43,871	0	43,871
TOTAL: CONSTRUCTION	61,082	4,103	65,185	80,338	8,327	88,665	141,420	12,430	153,850
GENERAL INVESTIGATION									
Plan Formulation									
Colorado River Recharge Study	100	100	200	50	50	100	150	150	300
TOTAL: GENERAL INVESTIGATION	100	100	200	50	50	100	150	150	300
TOTAL: ALL APPROPRIATIONS	61,182	4,203	65,385	80,388	8,377	88,765	141,570	12,580	154,150

Bonneville Unit, Central Utah Project

Question: Section 2 of Public Law 100-563 required the Secretary to complete an environmental impact statement for the Irrigation and Drainage System of the Bonneville Unit of the Central Utah Project. The EIS was to be completed and submitted to the Congress not later than December 31, 1989. What is the status of the EIS? Will it be completed on time?

Answer. To date, it has not been possible to do any meaningful work on an environmental impact statement on the Irrigation and Drainage (I&D) System. Necessary details about the I&D System won't be available until the Upper Basin States and the Colorado River Energy Distributors Association (CREDA) reach agreement regarding the financing of the Colorado River Storage Project activities and until the Central Utah Water Conservancy District clarifies its plans for the I&D System. Since insufficient details on the I&D System are available, we think it is impossible to prepare a sound EIS by December 31, 1989. Based on the complexity of the project, it is estimated that at least 18 months will be required to develop an Environmental Impact Statement (EIS) once such details are available. Therefore, we believe the Congress should modify the deadline to require completion and delivery of the EIS 18 months after legislation to effect the above agreement is enacted.

Question: The fiscal year 1986 appropriation act requires completion of the Bonneville Unit of the Central Utah Project by 1995 or a penalty of $2 million per year for a period not to exceed five years will be assessed. Will the Bureau complete the project by 1995 as required by the act to avoid penalty?

Answer. In 1987 the Bureau's construction schedule provided for completion of the project by 1995. However, it has long been recognized that additional authorization to increase the appropriation ceiling would be required to complete the project. Therefore, the completion date presumed passage of necessary legislation and annual appropriations at the required projected levels. Last year legislation was introduced to increase the ceiling by $754 million, which would have allowed completion of the entire project. After considering several amendments, the legislation passed by the 100th Congress increased the ceiling by $45 million to fully fund and continue scheduled work in fiscal year 1990 on features other than the I&D System.

Currently, we expect to complete all features of the project by 1995 except the I&D System, which is contingent upon concluding negotiations relating to financing of the system. It is assumed that if successful negotiations are completed that legislation would be required to confirm them and address the penalty provision.

Leadville Mine Drainage Tunnel

Question: Could you provide an explanation of the work to be completed in FY 1990 with the funds recommended for the Leadville Mine Drainage Tunnel in Colorado? Is the "hazardous waste treatment plant" the major component of the mine water treatment system for the tunnel? Has the preparation of treatment plant specifications been initiated? What methods of treatment in the plant are being considered?

Answer: The funds requested FY 1990 would be spent for concrete lining the first 450 feet of the tunnel, constructing the treatment plant, and the drainage collection facilities. The major portion of this work would be the construction of the treatment plant. Preparation of final designs began in January 1989 and are scheduled to complete in August 1989 with a bid opening scheduled for early November and contract award scheduled for early January. Based on a pilot plant study, the treatment process to remove heavy metals from the Leadville Mine Drainage Tunnel effluent will utilize air stripping, solid contact clarification, dual media filtration, and waste sludge dewatering. The pilot plant study showed the waste sludge to be nontoxic.

Question: Has design and engineering been initiated? Is authorization needed to design the plant? Is authorization needed for construction? What is the projected cost of the plant? If authorization or funding is not provided by Congress, how would BOR meet its obligation for compliance?

Answer: Congressional authorization is not required for design work, and all engineering preliminary to design, including the pilot plant study, is completed. Final designs are currently underway and are approximately 50 percent complete. Interior believes that Congressional authorization is required to construct and operate the plant and authorizing legislation has been submitted by the Administration for consideration by the 101st Congress. The estimated cost of the treatment plant and other appurtenant works is $10,700,000. If the funding and authorization required for this work is not provided by Congress, Reclamation will have no legal means of complying with the required discharge limits for the tunnel.

Question: How extensive were the studies conducted under PL 94-423 which stipulates "...investigations leading to recommendations for treatment measures..."? Were they limited to the Leadville Mine Drainage or did they include other areas and problems which are under Federal, state or private ownership but not under the Bureau of Reclamation?

Answer: Generally, the studies conducted by Reclamation were limited to the Leadville Mine Tunnel Drainage. Initially 26 methods of treatment were reviewed and 4 were studied. Some consideration was given to conveying the effluent from the tunnel to a central point for joint treatment with other contaminated mine drainage wastes from the Leadville area. Several alternative routes for conveying these discharges were estimated by Reclamation. However, it was found that there was no benefit to joint treatment, due to differences in the constituents of the other discharges.

Question: As far as you know, have there been any comprehensive studies of mine drainage and related water pollution problems of the whole Leadville area? How long have these problems existed in the area?

Answer: Mining activities began in the Leadville area in 1861 with placer deposits of gold in California Gulch. As underground mining progressed, drainage became an economic factor in mine operation. The Yak Tunnel, the first major effort to improve drainage, was started in 1895. EPA estimates that 60,000 feet of tunnels and major laterals are associated with this tunnel system. This tunnel may have been the first major contributor to mine drainage pollution. The second major drainage effort was the Leadville Mine Drainage Tunnel which was started in 1943.

The EPA began a preliminary evaluation of California Gulch in 1982. In 1983 the greater Leadville area was placed on the National Priorities List of Superfund Sites. They began Phase I Remedial Investigations in 1984 of the site which includes the City of Leadville and encompasses an 11.5-square-mile watershed that drains to the Arkansas River. The EPA's focus of attention thus far has been the Yak Tunnel, owned by ASARCO and others. They issued a Record of Decision on the Yak Operable Unit in March 1988 which is now being implemented. Subsequent operable units will address mine wastes, ephemeral surface water, groundwater, soils, and other environmental media.

Question: Would you say that the expertise gained from your studies of the Leadville Drainage Tunnel could be applicable to developing solutions to some of the other problems in the Leadville area in a comprehensive way?

Answer: Yes. Not only Reclamation's experience with the Leadville Mine Drainage Tunnel, but with other projects where we have provided technical assistance to the Superfund Program.

Question: Could you suggest some ways in which the Bureau's expertise could be utilized? Could you provide technical assistance? What additional funding levels, if any, would be necessary to provide expertise or other assistance in FY90? I understand that the Bureau could also provide some assistance under the Contributive Fund Act of 1922. Could you explain?

Answer: Since much of the response on the Leadville site will be the direct responsibility of the Potentially Responsible Parties (ASARCO and other) under EPA's CERCLA Authority, Reclamation's role could be that of technical oversight and organizational support for those activities. Funding required for such assistance in FY 1990 may range from $300,000 to $500,000, if responsible parties request assistance and provide the necessary funds.

Regarding assistance under the Contributive Fund Act of 1922, the preponderance of costs associated with investigations and cleanup at Leadville are being borne, either directly under Consent Decree with EPA, or indirectly through cost recovery procedures, by the respondents under the CERCLA/SARA authorities. Therefore, utilization of a Reclamation funding source may be inappropriate.

QUESTIONS SUBMITTED BY QUENTIN N. BURDICK

BUREAU OF RECLAMATION

Garrison Diversion Unit

Question: Do you think it would be possible to reactivate the Garrison Diversion Unit? What is the history of picking up projects, once they have been discontinued?

Answer: Yes, I think it is possible to reactivate work on Garrison. There have been several projects stopped because of technical reasons that were not resumed, but I am not aware of any projects stopped for budgetary reasons that have not been reactivated or considered for future work.

Question: Tell me, does anyone in the Bureau of Reclamation honestly believe or even dare to hope that we will ever realize any meaningful irrigation from this project, or that the cities of Fargo and Grand Forks will ever receive water from the project? Failing in either or both of these objectives, what will North Dakota have gained from agreeing to the flooding of over 600,000 acres of prime Missouri River bottom lands for the Garrison and Oahe Reservoirs? It seems to me that the project is shaping up as a net loss for my state.

Answer: The GDU Reformulation Act of 1986 provided the opportunity for development of irrigation and for a Sheyenne River water supply and release feature capable of delivering 100 cubic feet per second of water for the cities of Fargo and Grand Forks and surrounding communities. Although the development of these features is subject to numerous prerequisites under the same law, including reports of studies, the execution of an amended repayment contract and compliance with the National Environmental Policy Act of 1969, it is anticipated that the project, as reformulated, will be completed. A lower rate of funding in FY 1990 will have the effect of deferring the project completion, but it is intended that funding for the project is being postponed rather than abandoned.

Question: Isn't it true that the Missouri River mainstem dams, including Garrison, were invaluable last summer in providing water for whatever minimal flows there were in the Mississippi River during the extended drought?

Answer: During the summer of 1988, water released for authorized purposes from storage at the mainstem reservoirs on the Missouri River made up a higher than normal portion of the flow in the Mississippi River below the confluence. Due to the critically low levels on the Mississippi River, this water from storage provided substantial benefits, especially to navigational interests and for maintaining municipal water intakes.

Question: In other years, haven't they been of similar help in alleviating flood damage in down-stream states?

Answer: The Missouri River mainstem reservoirs, including

Garrison Reservoir, have provided very substantial benefits in terms of downstream flood protection. Estimates provided by the U.S. Army Corps of Engineers show the total flood damages prevented by the system since construction is $2.7 billion.

Question: Could you provide some information on how irrigation farmers fared in last summer's drought compared to their dryland brothers?

Answer: In 1988 most irrigators received normal or above normal yields. Near record yields were obtained from the irrigated research sites at Carrington and Oakes. Dryland farmers, by contrast, had below average yields and depended very heavily on Department of Agriculture farm assistance programs.

Question: In my state and surrounding states, farmers were compelled to sell all or part of their cow herds due to lack of grazing or hay. Had our irrigation project been in place, we could have saved many of those herds, couldn't we? Do you have any way of estimating that type of loss?

Answer: We believe that the authorized 130,000-acre Garrison Diversion Unit Project could have supported an increase in the total number of cattle being raised in the State of North Dakota. The actual inventory of cattle in North Dakota declined from about 1.8 million to about 1.6 million in 1988, according to information supplied by the North Dakota Agricultural Statistics Service. We are unable to determine what portion of this decline was attributable to the drought and what the effect of a completed Garrison Diversion Unit might have been.

Question: Would you tell us what your schedule of activities would have been under your initial submission to OMB?

Answer: The schedule of activities that would have been undertaken with a $66 million appropriation for FY 1990 is as follows:

MR&I program	$20.0 million
Indian MR&I	8.0
Construction	8.1
Fish and wildlife	9.2
O&M	4.0
Recreation	2.5
Indian irrigation	3.5
Sheyenne release facility	2.0
Preconstruction	8.7

Question: Do the same for your appealed level of funding.

Answer: If the $66 million would have been reduced to $48 million, the following activities would have been undertaken:

MR&I	14.75
Indian MR&I	8.0
Construction	8.1
Fish and wildlife	8.2
O&M	3.2
Recreation	1.3
Indian irrigation	1.2
Sheyenne release facility	0.5
Preconstruction	2.85

Question: What would your out-year requests have been projected to be under either of these scenarios?

Answer: The out-year funding requirements under the $66 million proposal were as follows:

1991	$ 97,640,000
1992	121,870,000
1993	108,620,000
1994	101,190,000

The out-year funding requirements under the $48 million proposed were as follows:

1991	$74,800,000
1992	92,700,000
1993	82,100,000
1994	77,300,000

Question: I feel confident that Garrison will be funded at a level higher than proposed in the Budget and I shall certainly do everything I can to that end. How would you utilize, say, the same level of funding as provided in the current fiscal year? What impact would that have on your out-year projections? What is the status of the Sykeston study? As I recall, in our report accompanying the Energy and Water Development Appropriations Bill last year, we instructed you to have that report completed by the end of November 1988. It wasn't; why wasn't it? When it became obvious that it would be late, why weren't those of us involved notified?

Answer: While a detailed program utilizing $30 million (the same as FY 1989) has not been fully evaluated, the following program schedule would be anticipated.

MR&I program	$6.20 million
Indian MR&I program	5.10
Construction	8.10
Fish and wildlife	4.40
Recreation	0.5
Indian irrigation	0.5
O&M	2.2
Preconstruction	3.0

The outyear funding requirements would be substantially the same as a $48 million funding level in FY 1990.

The Sykeston Canal study was conducted and the resulting project report was completed and distributed to interested parties on March 21, 1989. Comments on the report have been requested to be submitted by May 31, 1989. The final decision on the alignment of the Sykeston Canal will be part of an environmental impact statement decision process. The report, along with comments received in response to the report, will be utilized in that future process. As you know, the Secretaries of the Interior and State must determine that the location, construction, and operation of Sykeston Canal will not violate the Boundary Waters Treaty of 1909 with Canada.

The committee of Reclamation technical experts which was formed beginning in July 1988 to conduct the study addressed a number of complex and difficult issues and was unable to compete the study by November 1988. Informal, periodic reports on the status of the study and on the preliminary findings of the study were provided to the Garrison Diversion Conservancy District's management and to representatives of the North Dakota State Water Commission as the study progressed. Based on the extensive interactions, we felt all involved in the process were aware of the schedule. It was an oversight that we did not formally advise all interested parties of the delayed schedule.

Question: I believe mitigation acquisitions are current with construction of project features at this time, are they not?

Answer: Sufficient land has been acquired to offset project impacts to date. However, since development needs to be completed before a transfer is made, sufficient land has not yet been transferred to the managing entity to meet mitigation concurrency.

Question: What are the Bureau's plans for diverting Missouri River water to the Devils Lake area as suggested in the Garrison Diversion Unit Commission Report? Would this be feasible using the Sykeston Canal as the connection between the McClusky and New Rockford Canals?

Answer: Presently, the Bureau has no plans to divert Missouri River water to the Devils Lake Area. The Commission Report recommends that construction of an outlet and future funding for an inlet be considered and that initiation of either feature be based on the outcome of the current Corps of Engineers studies, NEPA compliance, permitting reviews, and satisfactory completion of consultations with Canada. We do not plan to initiate a study for an inlet to the Devils Lake Basin until the Corps of Engineers outlet study is completed.

The size of Sykeston Canal is limited by the GDU Reformulation Act to that required for irrigation and MR&I water needs. Although the feasibility of providing water through Sykeston Canal to Devils Lake has not been assessed, water could be provided through Sykeston Canal during nonpeak periods.

Question: Would the proposed Mid-Dakota Reservoir provide a more stable water supply than the Sykeston Canal?

Answer: From a design and operational standpoint, a storage/reregulation reservoir located along the Garrison

Diversion Unit Principal Supply Works would be advantageous. Prior to the Reformulation Act of 1986, all plans proposed for construction included water storage and regulation. A reservoir located along the principal supply works would reduce the need for high technology computer control systems and would allow for maintenance and emergency downtime at upstream pumping plants and canals without disrupting water deliveries.

QUESTIONS SUBMITTED BY SENATOR DENNIS DeCONCINI

BUREAU OF RECLAMATION

Central Arizona Project

The completion of the Central Arizona Project continues to be my highest priority in the United States Senate. Thanks to the continuing support from the committee and the Department, as well as a great many Arizonans, we are fast approaching the realization of this dream. I am particularly pleased with the funding requested for the CAP in FY 90 --- $219 million. By allowing the Bureau to work at its full capability on the project, the Administration has demonstrated a real commitment to see that it is completed and our goal of water in Tucson by 1991 is met.

Mr. Commissioner, in June 1987, Plan 6 was modified to exclude Cliff Dam. The Bureau was charged to work with the Army Corps of Engineers to identify appropriate flood control solutions on the Salt and Verde Rivers to replace the flood protection Cliff Dam would have provided.

Question: What is the status of the Bureau's and the Corps' efforts to identify possible flood control solutions on the Verde and Salt Rivers in view of the loss of Cliff Dam?

Answer: The joint Bureau and Corps studies began in the fall of 1987. Based on the Corps draft, in November 1988, the Bureau reported to the local sponsors of Plan 6 that the flood control options that had been studied were not economically justified. Subsequently, the Bureau identified a new operational concept that might reduce the cost of flood control sufficiently to justify a project. Studies on the new concept are currently underway and are expected to be completed within a year.

Question: Have specific flood control solutions been identified? If so, what are they? Do you have any indications as to their feasibility with respect to costs versus benefits?

Answer: The original flood control options included the addition of flood control space to either Horseshoe or Bartlett Dams, the reregulation of existing space at either dam, downstream levees or channels, and other non-structural measures. The Bureau has concentrated on new flood control space - the only option that the Bureau has the authority to construct under CAP. Twelve different flood control sizes were investigated in conjunction with two possible SOD fixes on the Verde River. None of the options proved economically justified. Subsequently, the Bureau has identified a new operational concept that might reduce the cost of adding flood control to Bartlett Dam in conjunction with the Horseshoe Dam failure SOD option. The new concept has been discussed with the local sponsors of plan 6, and studies to determine the economic feasibility are underway. These studies should be complete in a year.

Question: Also, Commissioner Duvall, the Bureau was directed to identify potential sources of water to replace the supplies that were developed by Cliff Dam.

Can you please provide the committee with the status of the Bureau's efforts to identify water supplies to replace those lost by the demise of Cliff Dam?

Answer: The Bureau has investigated numerous options for acquiring a replacement water supply. On December 8, 1988, the Bureau presented 5 proposals for replacement water supply sources to the cities contributing upfront funding for Plan 6. The cities requested that the Bureau develop more information on the potential sources and develop one proposal. They asked for an extension of the date by which they must decide on whether to leave their existing payments in escrow. Negotiations on extending the date and other issues are currently underway.

Question: Is there sufficient funding in the FY 90 budget request to continue with these efforts?

Answer: There is sufficient funding in the FY 1990 budget request to continue efforts to identify water supplies to replace water supplies lost as a result of Cliff Dam being deleted from Plan 6.

Question: When do you anticipate being able to present recommendations for Cliff replacement water?

Answer: The Bureau expects to present the additional data requested by the cities and a composite water supply replacement option by September 27, 1989. This date has not yet been formally accepted by the cities.

Indian Water Rights Settlements

Question: As you know, in the previous administration, the Department of Interior undertook an aggressive policy of negotiating settlements for Indian water rights disputes. As a result of these efforts, we were successful in enacting into law three settlements in the last Congress. Secretary Lujan has indicated that this policy will continue.

Can you please provide the committee with the status of the Department's efforts to negotiate other Indian water rights disputes? On which ones have negotiations begun? Do you anticipate any being settled and ready for congressional action in the near future?

Answer: Although there are numerous settlements in differing phases of technical study, the Department is actively pursuing 5 settlements. These include:

1. Fort McDowell Reservation
2. Gila River Indian Community
3. Warm Springs Reservation
4. Fort Hall Reservation
5. Jicarilla Apache Tribe

Although it is difficult to predict the outcome of these activities, we believe that it is possible that all five might be concluded in time for consideration by the 101st Congress. We do not expect any negotiations to be concluded before the end of calendar year 1989.

Question: Is the administration's underfunding of the three Indian water rights settlements enacted into law last year, having a negative effect on the Department's ability to negotiate other Indian water rights settlements? Do you anticipate the non-federal participants in future negotiations becoming less likely to participate in these negotiations in view of the questions about the willingness of the Federal Government to meet its commitments negotiated in the settlements agreed to last year?

Answer: The three Indian water right settlements were enacted into law late in 1988 at a time when the Administration was in the final stages of formulating its FY 1990 budget. Many budgetary decisions with amounts had already been made; However, some funding adjustments were made to support these three agreements. It is my understanding that the FY 1990 request is viewed by the Indian communities involved as well as many in the House and Senate as a good faith effort to respond to these new laws. Consequently, because the Administration moved very quickly to provide some funding for these settlement agreements, we think that a positive signal has been sent to Indian leaders that the Administration is serious in its commitment to negotiate future Indian water right settlements.

Coolidge Dam

Question: Interior Department documents indicate that Coolidge dam poses, "... a real and immediate hazard ... to person and property" living downstream from this structure. For the past four years, we have funded Safety of Dams studies for Coolidge dam.

What is the status of these Safety of Dams studies the Department has undertaken on Coolidge Dam? When do you expect to issue a report on the condition of Coolidge dam and offer recommendations as to what it will take to make this structure safe?

Answer: The Modification Report is in a final draft form and is being circulated for final review within the Department. We anticipate that the report will be forwarded to Congress in the next several weeks. The Modification Report for Coolidge

Dam will include a report on the condition of the dam and will indicate the recommended corrective actions needed to make the structure safe. The Secretary has already taken steps to make $1.9 million available for necessary preconstruction work in FY 1989 and FY 1990.

Question: Where does Coolidge Dam rank among the other dams the Department of Interior has studied with respect to its current condition and the threat to those living downstream in the event it should fail? Out of the top fifty high risk dams in the country, which of these have not had any Safety of Dams work undertaken on them?

Answer: On the Department of the Interior technical priority list, Coolidge ranks as number 35. That list provides a ranking of all Interior dams based on physical conditions. Failure of these dams would cause loss of life or property damage downstream. With regard to Coolidge Dam, both its poor condition and the high downstream risks combine to give it priority ranking. On the technical priority list, out of the top 50 dams, all of them have at least been inspected and had preliminary studies performed on them. As that work progresses, corrective action will be proposed if it proves necessary.

Question: Has the Department made a decision as to which agency --the Bureau of Indian Affairs or the Bureau of Reclamation --will assume the role of lead agency to undertake the necessary repairs to Coolidge Dam?

Answer: Because of its technical expertise, the Bureau of Reclamation will take the lead on undertaking the necessary repairs to Coolidge. With regard to funding, the Bureau of Indian Affairs will transfer $500,000 in FY 1989 to the Bureau of Reclamation to initiate preconstruction work needed to expedite this project. The balance of preconstruction work needed in FY 1990 is planned to come from Bureau of Reclamation Safety of Dams funds. The Bureau of Reclamation is currently working with the Solicitor to determine the extent to which the cost-sharing provisions of the Safety of Dams Act may apply to this project. Construction funding needed in FY 1991 will be addressed in the FY 1991 Budget process which is now underway in the Department.

Question: Of the total $650 million authorized in the 1984 Safety of Dams legislation, what has the Department actually spent to this point in time?

Answer: By the end of FY 1989, the Bureau will have obligated $228 million, and the FY 1990 program will require an additional obligation of $30 million.

In terms of funds programmed through the outyears, however, by the end of FY 1989 the Bureau will have work underway that requires $605 million for safety of dams activities. This figure does not include $43.3 million estimated for work on Coolidge Dam.

Question: Is there adequate budget authority to undertake the repairs at Coolidge Dam?

Answer: Yes.

Question: What are the estimated costs for the modifications required to make Coolidge dam safe?

Answer: The estimated cost to repair Coolidge dam is $43.3 million based on January 1988 prices.

Question: Assuming there is adequate authority to undertake the modifications to Coolidge dam, when could the Bureau commence construction activity on an expedited schedule?

Answer: Reclamation will initiate design data collection in June 1989. Specifications would be issued in late FY 1990 with a contract in early FY 1991. We expect the work to be completed in late FY 1993.

Question: What funding would be required in FY 90 to commence Safety of Dams activities on Coolidge dam on an expedited schedule?

Answer: Approximately $1.4 million would be required in FY 1990. This funding would allow completion of the design data collection and initiation of designs and specifications.

QUESTIONS SUBMITTED BY SENATOR PETE V. DOMENICI

BUREAU OF RECLAMATION

Review of Disposition of Oil and Gas Revenues on Acquired Lands of the Carlsbad Irrigation District in Carlsbad, New Mexico

Question: Working with the Solicitor's Office, the Bureau of Reclamation has been undertaking a review of the disposition of oil and gas revenues on acquired lands of the Carlsbad Irrigation District in Carlsbad, New Mexico. Depending on the opinion that is issued, this review could have profound implications on the disposition of such revenues on all irrigation districts in the country. Could you provide me with an update on where the Bureau is on this review?

Answer: After completion of a draft report by the Miscellaneous Revenues Task Force, the Bureau of Reclamation, on April 28, 1989, requested that the Department of the Interior's Solicitor provide a legal review and determination regarding the proper distribution of mineral leasing revenues from project lands.

Question: A number of irrigation districts have asked for representation on the Bureau Task Force that was set up to review this issue. What is your response to that request?

Answer: The Miscellaneous Revenues Task Force was established and charged with conducting an internal review of the proper distribution of miscellaneous revenues. Representation from any individual or group outside the Department of the Interior has not been included. We will keep water district officials informed of any findings and decisions that are made concerning the proper distribution of miscellaneous revenues.

Animas-La Plata Project

Question: Last session, the Congress enacted the Colorado Ute Indian Water Rights Settlement Act. This Act facilitated a complex settlement agreement that ended a decade of litigation involving Indian tribes, the Federal Government, and public and private non-Indian water users in New Mexico and Colorado. The negotiation of the settlement agreement itself took four years.

Construction of the Animas-La Plata Project, first authorized by the Colorado River Storage Projects Act of 1968, is an essential component of the Act and the settlement agreement. Both the cost-sharing agreement for the project negotiated by the Federal Government and the language of the Colorado Ute Indian Water Rights Settlement Act were based on a twelve-year construction cycle for the project.

The Bureau of Reclamation's FY 90 budget includes $3.7 million for the Animas-La Plata Project. However, the Bureau would need $5.9 million in FY 90 to meet its obligation to construct the Animas-La Plata Project in twelve years.

Furthermore, the Bureau has indicated that all further work on the Project will be suspended until other Western water projects are completed.

Both the funding level recommended by the Administration and the Administration's stated intention to suspend activity on the Animas-La Plata Project will make it difficult for the Federal Government to complete construction of the Project within twelve years, as promised in the Colorado Ute Indian Water Rights Settlement Act.

Is the Bureau of Reclamation committed to the twelve-year construction cycle for the Animas-La Plata Project that was approved in the Colorado Ute Indian Water Rights Settlement Act approved last year?

Answer: The Bureau supports the construction of the Animas-La Plata Project; however, because of limited financial resources available to the Federal government, we find it necessary to fund only those projects currently underway. Work on the Animas-La Plata Project has been limited to preconstruction activity. Funding availability may be a prime factor in complying with the delivery agreement.

SUBCOMMITTEE RECESS

Senator **Reid**. Before recessing this subcommittee, the staff just indicated to me, and I do not know what counts, but that Colonel North was convicted on some of the counts. On, three counts?

A Voice From Audience. Three of twelve.

Senator **Reid**. Three of twelve. Is there time to which this—we will recess until when?

This subcommittee stands recessed subject to call.

[Whereupon, at 3:30 p.m., Thursday, May 4, the subcommittee was recessed to reconvene subject to the call of the Chair.]

ENERGY AND WATER DEVELOPMENT APPROPRIATIONS FOR FISCAL YEAR 1990

THURSDAY, MAY 18, 1989

U.S. Senate,
Subcommittee of the Committee on Appropriations,
Washington, DC.

The subcommittee met at 2 p.m., in room SD-192, Dirksen Senate Office Building, Hon. J. Bennett Johnston (chairman) presiding.

Present: Senators Johnston and Domenici.

DEPARTMENT OF ENERGY

Office of Energy Research

STATEMENT OF DR. ROBERT O. HUNTER, JR., DIRECTOR, OFFICE OF ENERGY RESEARCH, U.S. DEPARTMENT OF ENERGY

OPENING STATEMENT

Senator **Johnston**. Good afternoon. The hearing will come to order.

This afternoon we hear from a very distinguished group beginning with Dr. Robert O. Hunter, Jr., Director, Office of Energy Research of the Department of Energy.

The fiscal 1990 budget request for science and technology programs under Dr. Hunter's direction is $2.5 billion, an increase of $290 million over the fiscal year 1989 appropriations. The programs are high energy physics, the superconducting super collider, nuclear physics, basic sciences, biological, and environmental sciences, including the human genome project, and global warming research, also university research and the national labs.

Dr. Hunter will, I hope, address these with a broad brush and I will interrupt perhaps with questions both during and after the testimony. As you know, we have the actual figures so, we don't want to talk so much numbers as to hear the overview on these things and to explore with some questions.

So, with that, Dr. Hunter, why don't you proceed?

PREPARED STATEMENT

Dr. **Hunter**. Thank you, Mr. Chairman. It is a privilege and a pleasure to be here before you today. I am here to discuss the Department of Energy's request for fiscal year 1990 and the Basic Research Program.

I have submitted testimony for the record, and with your permission, I would like to proceed with some brief summary remarks.

Senator **Johnston**. Yes; we will put the statement in the record.

Dr. **Hunter**. Thank you.

[The statement follows:]

STATEMENT OF ROBERT O. HUNTER, JR.

Director, Office of Energy Research
Department of Energy

Mr. Chairman and Members of the Subcommittee:

It is a pleasure to appear here today to present the FY 1990 budget request for the programs supported by the Office of Energy Research (ER). These programs are: High Energy Physics, the Superconducting Super Collider, Nuclear Physics, Basic Energy Sciences, Magnetic Fusion Energy, Biological and Environmental Research, Energy Research Analyses, University Research Support, University Research Instrumentation, Multiprogram Energy Laboratories-Facilities Support, and supporting program direction.

Funding for these programs in FY 1990 is being requested under the two appropriations shown in Table 1, Energy Supply R&D and General Science and Research. The total FY 1990 budget request for ER's programs is $2.5 billion, an increase of $292 million over the FY 1989 appropriation of $2.2 billion.

Table 1
Office of Energy Research
Summary by Program
Budget Authority
($ in millions)

	FY 1988	FY 1989	FY 1990 Request
Energy Supply R&D			
Basic Energy Sciences	$ 557.7	$ 549.3	$ 590.0
Magnetic Fusion Energy	331.3	350.7	349.2
Biological & Environmental Research	267.1	257.5	271.4
University Research Support	18.2	21.7	16.1
University Research Instrumentation	4.9	5.0	5.0
Energy Research Analyses	3.7	3.8	4.0
Advisory & Oversight Program Direction	3.2	3.3	3.4
Policy and Management	.7	.7	.7
Multiprogram Energy Laboratories-Facilities Support	53.6	55.7	53.0
Small Business Innovation Research	30.1	0	0
Subtotal	$ 1,270.5	$ 1,247.7	$ 1,292.8
General Science & Research			
High Energy Physics	$ 526.1	559.4	616.2
Superconducting Super Collider	33.0	98.6	250.0
Nuclear Physics	242.8	260.9	299.3
General Science Program Direction	2.8	3.2	3.9
Transfer of Prior Year Unobligated Balances	(8.0)		
Subtotal	$ 796.7	$ 922.1	$ 1,169.4
Total ER	$ 2,067.2	$ 2,169.8	$ 2,462.2

This request reflects the Department's recognition of the key role played by science in enhancing the economic and technological well-being of the United States, as well as the quality of our lives. It also reflects our continuing commitment to excellence in the programs supported by the Office of Energy Research. I would like to discuss the programs under the General Science and Research appropriation first, followed by those under the Energy Supply R&D appropriation.

HIGH ENERGY PHYSICS

Research in high energy physics pushes beyond the existing frontiers of knowledge about the physical world in which we live. This research not only helps us to learn how our world works, it leads to the development of advanced technology needed to ensure research progress--technology which, over the years, has had many practical applications in such areas as nuclear medicine, electronics, computer chips, superconductivity, and cryogenics.

The continuing goal of the High Energy Physics program is to improve our understanding of the nature of matter and energy and of the basic forces that govern all processes in nature. High energy physicists search for new knowledge through an interplay of experimental research using accelerators and detectors, and through theoretical studies. The ability to carry out forefront exploratory research on the physics frontier is dependent on many factors including the experimental capabilities of accelerator, colliding beam, and detector facilities; the effective use of those facilities; and the incorporation of upgraded and new facilities on a timely basis to take advantage of new technologies and research opportunities.

Progress in the experimental and theoretical research supported by the High Energy Physics program is also dependent on scientists from over 100 universities who carry out over three-fourths of this research. They provide much of the intellectual leadership for the field along with the scientists from the national laboratories who make up the rest of the experimenters. The

High Energy Physics facilities also play an important role in the training of highly skilled scientists and engineers who often contribute significantly to the transfer of technology to other fields.

Our understanding of the nature of matter and energy and the basic forces has grown substantially in recent years; but the search continues for a unified, or single, theory that can explain the connections among the basic forces of nature. The four known fundamental forces are the electromagnetic force, the weak force, the strong force, and the gravitational force. A part of the progress in high energy physics has been the conceptual unification of the weak nuclear force and the electromagnetic force into a single "electroweak" framework. In addition, a theory of the strong force has emerged which is consistent with experimental results. There is increasing anticipation that the unification of the strong nuclear force and the electroweak force into one "grand unified" framework may be possible, thus reducing the apparent number of forces in nature to two. The ultimate goal is a "super-grand" unification that would bring the fourth force, gravity, into the equation, thus bringing all of the forces in nature into a single unified framework.

Based on this progress, scientists have drawn a picture of nature known as the Standard Model which is defined in terms of the electroweak and strong forces and a small set of fundamental constituents present in all matter we see around us. Although the most significant recent experimental results all reinforce the predictions of the Standard Model, scientists believe that it cannot be the final answer. For example, it does not explain the origin of mass and it does not include gravity. Clearly, we do not yet know the final answer to many questions. For instance, have we discovered the ultimate constituents of matter or is there something inside leptons and quarks, which we believe are the fundamental particles? Do we know all the forces of nature and are all of the forces a manifestation of a single force?

Research aimed at answering these questions is currently being carried out at accelerators at three centers supported by the Department of Energy: the Fermi National Accelerator Laboratory (Fermilab), the Stanford Linear

Accelerator Center (SLAC), and the Alternating Gradient Synchrotron (AGS) at Brookhaven National Laboratory (BNL). Each of these laboratories provides world unique capabilities and is operated as a national facility available to qualified experimenters from around the world on the basis of the scientific merit of their proposals. This practice of relying on one-of-a-kind, large, advanced facilities has a long track record of success. The talented physicists attracted by research opportunities at these facilities have continued to produce impressive, Nobel-class research results. Both of the two new major U.S. High Energy Physics facilities, the Fermilab Tevatron Collider and the Stanford Linear Collider (SLC), are now operating for physics research. These facilities will keep the U.S. program at the cutting edge for the next several years. To maintain an internationally competitive program at the scientific frontier in the late 1990's, the Superconducting Super Collider (SSC) is being proposed for initial construction in FY 1990. The SSC, which will be discussed later in this statement, is in keeping with the successful High Energy Physics tradition of large, advanced accelerators operated as user facilities that attract the best talent and produce the most promising and exciting research results.

Before turning to a discussion of the FY 1990 budget request, I would like to summarize some of the progress made at the three High Energy Physics accelerator facilities. The Tevatron at Fermilab has been running at world record energy and luminosity in the colliding beam physics run which began in late FY 1988 and will end in a few weeks. The higher luminosity available at the Tevatron, which has exceeded its design by a factor of two, allows scientists to observe a larger number of particle interactions of interest than is possible at other facilities. During the Tevatron physics run the Collider Detector at Fermilab (CDF) is intensively searching for an as yet unobserved particle known as the top quark. The existence of the top quark has been predicted by the Standard Model. Thus, the top quark search--which puts Fermilab and the European high energy facility, CERN, in a vigorous race for a major discovery--will provide a crucial test for this fundamental theory. In fixed-target experimentation at Fermilab, an 8 1/2-month long run was successfully completed in 1988. Eight major experiments were completed; data analysis is in process and physics results will begin to emerge in 1989.

At SLAC, the Stanford Linear Collider (SLC) has reached its first goal of demonstrating that two very small (a fraction of the diameter of a human hair), very high energy beams of electrons and their oppositely charged cousins, positrons, can be brought into head-on collision for a number of hours. The SLC has demonstrated the concept of linear colliders using fifty billion electron volt (GeV) beams and is providing crucial data on the feasibility of the next generation higher energy linear colliders. This concept will likely be the foundation for the next generation of electron-positron colliders. The second goal of the SLC is to study the Z^0 particle, which is the carrier of the weak nuclear force. Commissioning of the SLC as a research facility continues, and the study of Z^0 physics is underway. Currently, more than a dozen Z^0 particles have been observed, and it is expected that several thousand Z^0 particles will be accumulated for study in 1989. Detailed study of the Z^0 particle, of which only a few hundred have been observed in the world to date, provides yet another key test of the Standard Model and will shed light on the possible existence of a whole new generation of particles. Also at SLAC, the Time Projection Chamber detector at the Positron-Electron Project (PEP) has completed its first physics run since the completion of detector and beamline upgrades. The previous record for luminosity has been doubled. Data are now being analyzed with emphasis on measurement of decay lifetimes of short-lived particles.

At BNL, experiments are underway at the Alternating Gradient Synchrotron to study certain rare ways a particle called the kaon decays. The kaon can decay into many different combinations of other lighter particles. Some of these combinations occur very rarely, less than once in three billion ordinary decays. Comparison of experimental results with theoretical predictions will test current theories. The current experiments have already achieved results 10,000 times more sensitive than previous experiments and they offer the opportunity to find experimental evidence for new particles of very high mass. In addition, the AGS multiparticle spectrometer has the best evidence for the experimental identification of an unusual and, as of yet, unseen but predicted particle called a glueball. The quarks inside of protons, for example, are believed to be held together by exchanging an object called a gluon. Theory predicts that if two gluons combine, they would form a glueball. Observation of such objects would provide a new test of the Standard Model.

FY 1990 HIGH ENERGY PHYSICS BUDGET REQUEST

The FY 1990 request for High Energy Physics is $616.2 million. Of the total amount, $492.7 million is for Operating Expenses, $85.5 million is for Capital Equipment, and $38.0 million is for Construction (Tables 2 and 3).

Table 2
General Science and Research
High Energy Physics
Budget Authority
($ in millions)

	FY 1988	FY 1989	FY 1990 Request
Operating Expenses			
Physics Research	$114.4	$121.7	$133.1
Facility Operations	230.1	252.4	277.6
High Energy Technology	63.7	65.1	82.0
Subtotal	$408.2	$439.2	$492.7
Capital Equipment	76.7	79.8	85.5
Construction	41.2	40.4	38.0
Total High Energy Physics	$526.1	$559.4	$616.2

Table 3
General Science and Research
High Energy Physics
Budget Authority
($ in millions)

Project	Construction TEC	FY 1989	FY 1990 Request
Accelerator Improvements and Modifications (90-R-101)	$14.9	$ -	$ 14.9
Accelerator Improvements and Modifications (89-E-101)	11.7	11.7	-
General Plant Projects (GP-E-103)	13.4	-	13.4
General Plant Projects (GP-E-103)	11.1	11.1	-
AGS Accumulator/Booster (86-R-105)	31.7	14.0	5.0
Fermilab Linac Upgrade (90-R-104)	22.8	-	4.7
Fermilab Central Computing Facility Upgrade (86-R-104)	24.6	3.6	-
Total Construction		$ 40.4	$ 38.0

The Operating Expenses request of $492.7 million reflects strong utilization of existing forefront facilities, particularly the Tevatron proton-antiproton collider and the SLC electron-positron collider. In FY 1990, advanced high energy technology R&D will focus on increasing the luminosity of both the Tevatron and the SLC to maximize the physics output of the existing and new detectors.

The Operating Expenses request also provides for operation at SLAC of the recently upgraded PEP with the improved Time Projection Chamber detector as well as operation at BNL of the Alternating Gradient Synchrotron (AGS) program. The AGS program focuses on rare kaon decay, neutrino and unique polarized proton experiments. Leon Lederman, Director of Fermilab, along with Mel Schwartz and Jack Steinberger, won the 1988 Nobel Prize in Physics for early work on the still very productive AGS.

In keeping with the planned strong use of existing facilities, the Operating Expenses request includes increases for university-based scientists to allow their effective participation in research at these facilities. Funds are also being requested for improvement of the technical capabilities of the university laboratories. The universities play a major role in physics research, detector R&D, and detector fabrication. The requested funds will provide for upgraded instrumentation (e.g., computer-aided design systems, high-speed electronic test equipment, etc.) and broadening and upgrading of the technical support staff at universities.

The FY 1990 Operating Expense request includes funding to support an increased level of technology R&D in support of the operating accelerators, primarily the SLC and the Tevatron. This R&D is crucial in identifying and providing for the modification and improvements needed to maintain the capabilities of the facilities at the cutting edge of the science.

Finally, the FY 1990 Operating Expenses request includes funds to carry out advanced accelerator and detector R&D to develop advanced concepts and technologies. Test-bed verification of some of the most promising of these concepts will be emphasized in FY 1990.

The FY 1990 Capital Equipment request of $85.5 million will provide the particle beam-line components, detection apparatus, and data analysis systems essential to forefront high energy physics research. In FY 1990, priority will be given to completion of the Stanford Large Detector at SLAC and the D-Zero detector at Fermilab. The request also provides for an upgrade of the equipment at the SLAC Central Computing Facility.

The FY 1990 Construction request of $38.0 million includes funds to initiate the Fermilab Linac Upgrade project, a key element in maintaining a vital research program with the Fermilab Tevatron in the years before the SSC becomes operational. This $22.8 million project, with $4.7 million requested in FY 1990, will replace a portion of the accelerator hardware in the existing linac for which commercial replacement parts are no longer available. The upgrade will also result in an increase in the output energy from 200 to 400 million electron volts (MeV). This higher energy produces a smaller beam, better injection, and smaller beam losses in the booster, main ring and Tevatron thereby increasing the beam intensity and physics output. The Construction request also includes funds for the completion of the Alternating Gradient Synchrotron Accumulator/Booster project at BNL and an increased level of effort for Accelerator Improvement Projects and General Plant Projects to support the accelerator facilities and essential environmental protection efforts.

SUPERCONDUCTING SUPER COLLIDER

The Stanford Linear Collider at SLAC and the Tevatron at Fermilab, which I discussed previously, will keep the U.S. High Energy Physics program at the cutting edge of physics research for the next several years. But even these facilities will not reach high enough energies to allow physicists to investigate the region where major breakthroughs are anticipated. To advance the research frontier a new, more powerful, accelerator is needed. The Superconducting Super Collider (SSC) is that facility.

The SSC will consist of two rings of superconducting magnets and associated systems in a common tunnel, 53 miles in circumference. There will be four interaction regions where two beams of protons will collide head-on, making available a total of 40 trillion electron volts (TeV) of energy. These energies are expected to produce new types of matter and new forms of energy. Large detectors will be used in the interaction regions to detect and record these interactions. The SSC, through its investigation of fundamental physical processes, will provide new insights into questions of great significance to other sciences as well as to high energy physics. The Super Collider holds the potential for major, new breakthroughs in science and technology, and is expected to produce discoveries, innovations and spin-offs that will profoundly touch every American.

The FY 1990 budget request for the SSC includes funds to initiate construction. This request builds on five years of research, development, and design efforts and careful planning. While the SSC does extend current technology, its design is backed by a thorough conceptual design and is based on principles and engineering concepts used previously. The Super Collider's design, cost estimates, and schedule have been carefully documented and reviewed. The project is backed by an R&D program specifically related to the SSC that began in FY 1984. Prior efforts in the High Energy Physics program to develop accelerator-quality superconducting magnets, and experience gained in the successful operation of the Tevatron, support the SSC design.

A great deal has been accomplished over the last two years as a prelude to the Department's request for construction funds. For example, the superconducting magnets are the largest SSC technical element, with a requirement for nearly 10,000 superconducting magnets costing over a billion dollars. The ability to manufacture these magnets in a cost-effective manner, with stringent quality control and reproducibility, is critical to the success of the project. In December 1988, the Department announced selection of 16 industrial firms and teams for Phase I of the Magnet Industrialization Program which will aid in establishing an industrial capability to produce the nearly 10,000 superconducting magnets needed for the SSC. During Phase I, which began in January 1989, representatives from the selected companies are observing and discussing superconducting magnet fabrication processes, specification requirements, quality control and testing techniques at the laboratories. A second phase of the industrialization program, scheduled to begin in FY 1989, will provide the opportunity for industrial firms to design, tool and fabricate magnets in a demonstration of their capability to manufacture magnets.

In the area of R&D, significant progress has been made with regard to the magnets and the critical superconducting cable. Long magnets have been fabricated and successfully tested, thus demonstrating proof-of-principle of the current design. Production lots of cable which meet SSC specifications, as well as a prototype fast cabling machine, have already been delivered by industry. The magnet cryostat has successfully met the stringent low heat leak goal set for the SSC. An improved design of the cryosystem required to keep the magnets at their super-cooled temperature has been developed in collaboration with industry.

The site selection was completed with the designation of Texas as the final site on January 18, 1989. Since Congress has not yet given approval to the Department's construction request for the SSC, no irreversible actions will be taken at the site during FY 1989. However, the Department will be moving to locate SSC project management personnel at or near the site quickly to ensure that activities required to be conducted at the site can be carried out in a cost-effective manner. A number of actions have been completed or are underway to ensure an efficient transition to near-term site activities. Chief among these is the Department's selection of the Universities Research Association (URA) to build, manage, and operate the SSC laboratory. A contract was signed on January 18, 1989. Site geotechnical studies and gathering of facts for the Supplemental Environmental Impact Statement will begin shortly. A revised conceptual design reflecting the characteristics of the Texas site and the results of R&D since 1986 will be completed in the Fall of 1989. This revised conceptual design, which will include a new bottoms-up cost estimate and schedule, will be reviewed and validated by the Department early in 1990. It is also planned that URA will select on a competitive basis an architect engineer/construction management firm (AE/CM) by the Fall of 1989. The AE/CM will prepare the detailed facility design and manage the construction of the conventional facility.

The Department continues to seek substantial financial and scientific participation in the SSC from foreign governments in keeping with the goal of seeking approximately one-third of the cost of the SSC from non-Federal sources. Scientist to scientist contacts will be used to define the technical scope appropriate for collaboration. Once areas of collaboration have been defined, official negotiations between governments will follow and may use the framework of existing agreements where possible. In 1988, the Secretary of Energy sent formal invitations for participation to his six counterparts within the Economic Summit countries. The invitations were followed by several rounds of visits from high-level Departmental delegations to provide SSC status briefings and carry out initial consultations with representatives from the Summit countries. The newly extended Science and Technology agreement with India contains a section on possible collaboration on the SSC. This is a provisional annex for in-kind contributions with a value of $50 million. It is important to note that the Indian agreement is contingent upon a commitment of funds to the project by the U.S. Government and the settlement of the remaining issue of intellectual property rights in the umbrella agreement.

Significant funding for the SSC project was provided in FY 1989 for R&D, preliminary design, and site selection activities. We expect continuing R&D achievements throughout FY 1989, including definitive progress on refining and optimizing the design of the superconducting magnets, completion of Phase I and initiation of Phase II of the Magnet Industrialization Program, and increased effort on the injectors and other collider technical systems.

FY 1990 BUDGET REQUEST FOR SUPERCONDUCTING SUPER COLLIDER

The FY 1990 budget request for the SSC is $250.0 million. That request includes $69.0 million for Operating Expenses, $21.0 million for Capital Equipment, and $160.0 million for Construction (Table 4).

Table 4
General Science and Research
Superconducting Super Collider (SSC)
Budget Authority
($ in millions)

	FY 1988	FY 1989	FY 1990 Request
Operating Expenses	$ 33.0	$ 82.6	$ 69.0
Capital Equipment	-	16.0	21.0
Construction (90-R-106)	-	-	160.0
Total SSC	$ 33.0	$ 98.6	$250.0

The Operating Expenses request will provide for a continued significant level of R&D required to complete the design of the superconducting dipole magnets and to expand the magnet industrialization activities, which I discussed earlier, with particular emphasis on enhancing the reproducibility of the magnets and bringing down the unit cost per magnet. The requested funds will provide for extensive design, prototyping and testing of other collider systems, including the focusing and correction magnets. A significant program of detector R&D will also be carried out as this program moves from the generic phase to focus on specific SSC detectors.

The Capital Equipment request of $21.0 million will support the R&D activities on the many accelerator components and systems of the collider and its four injector accelerators, power supplies, test and control instrumentation, and components for the magnet test facility. The budget request also provides for prototypes of detector components as SSC experiments and detectors become more completely defined.

The FY 1990 Construction request of $160.0 million would allow initial construction activities to proceed on a broad front. The request includes $29.0 million for detailed design of technical systems, $29.0 million for detailed design of conventional facilities, $8.0 million for power and utilities distribution systems, $8.0 million for site preparations required to support the overall construction project, $20.0 million for injector technical components which are early critical path items, $30.0 million for long-lead, critical path procurements for collider components (including magnet tooling, superconducting materials, and magnet steel), $28.0 million for project management, support equipment and rental space, and $8.0 million to start on the first on-site shop and support buildings.

NUCLEAR PHYSICS

Nuclear processes determine the characteristics of our universe. Thus, an understanding of nuclei and nuclear phenomena is essential to any basic understanding of the world around us. What we are continuing to learn about nuclei and nuclear processes provides the information base for many areas of technology such as nuclear power, nuclear weapons, and nuclear medicine. The applications are varied and range from the diagnosis and treatment of cancer to the use of nuclear techniques for materials testing and geophysical exploration.

Over the years, many theoretical models have been developed to describe the structure of the nucleus and its behavior. Models in which nuclear matter is treated as a fluid (liquid drop model) or an organized collection of nucleons (shell model) have been well developed. Scientists now know that neutrons and protons, the constituents of the nucleus that are called nucleons, are composed of smaller constituents called quarks. These quarks are bound together in tightly knit groups of threes. However, scientists have not been able to isolate quarks outside the nucleus. It is as if quarks were tied together by elastic strings that cannot be broken. This confining mechanism forms the basis of the newest theory of the strong nuclear force, called quantum chromodynamics (QCD). Many aspects of this theory are addressed both by the Nuclear Physics and High Energy Physics research programs. However, only the Nuclear Physics program emphasizes tests of QCD predictions of quark behavior in nuclear matter. In these tests, individual quarks can be isolated and studied within nuclear matter.

The Nuclear Physics research program is carried out at accelerator facilities around the country. Many of these accelerators are located at the national laboratories, including Lawrence Berkeley Laboratory, Argonne National Laboratory, Oak Ridge National Laboratory, Los Alamos National Laboratory and Brookhaven National Laboratory. Others are at universities such as the Massachusetts Institute of Technology (MIT), Yale University, the University of Washington, Triangle Universities National Laboratory, and Texas A&M. In addition, Nuclear Physics research is performed using nuclear physics facilities in combination with the high energy accelerators at Brookhaven and SLAC.

In FY 1988, three new facilities began operation, and a fourth was being significantly upgraded. At Texas A&M, a superconducting cyclotron, constructed entirely with funding from the State of Texas and private foundations, was started up and will accelerate nuclei to moderate energies of around 100 MeV. Using the cyclotron, scientists will study how light nuclei oscillate when they react. In particular, a phenomenon called monopole oscillation will be studied, in which the nuclei expand and contract like a balloon being blown up. Because these nuclei and their reactions are the basis for nuclear fusion in stars (and in controlled fusion reactions), the data gained will be of great interest to astrophysicists.

The new Yale Tandem Accelerator will use medium-mass nuclei at lower energies of around 10-15 MeV to study extreme deformations of nuclei when they are forced together. Study of these dumbbell-shaped nuclei is expected to provide clues to the nature of the nuclear force and the fundamental way in which two pieces of nuclear matter can join together. For even heavier nuclei, the University of Washington's Superconducting Linac Booster will make available energies of up to 25 MeV which will allow study of the modes of oscillation of massive isotopes. The addition of the South Hall Ring experiment to the Bates electron accelerator at MIT will improve scientists' ability to study the spin components of nuclear particles and structures, characteristics vital to understanding nuclear matter.

The Nuclear Physics program in 1988 generated important research results in a number of fields. One of the most exciting areas was in the newly discovered phenomenon of superdeformed nuclei. Ordinarily, nuclei assume a spherical shape. However, in nuclear collisions, medium-sized nuclei such as barium and cerium can send each other spinning. At high spins, the shape of the nuclei changes into an ellipsoidal (football) shape. Surprisingly, in the deformed state, the nucleus seems to act rigidly, not as a spinning drop of fluid. How the collective action of the protons and neutrons within the nucleus gives it this rigid shape is a major question. Further studies of superdeformed nuclei may give clues as to how the shell model, liquid drop model, and other useful pictures of nuclear structure actually fit together.

An even deeper problem is the question of how the quarks are confined within the protons and neutrons that make up a nucleus. The theory of the quark model, quantum chromodynamics, predicts that at high density or high temperature, a phase change will occur and there will be collective or many particle effects--a quark-gluon plasma (QGP). Finding such a plasma would assist us in understanding and confirming QCD, while studying the plasma will greatly deepen scientific understanding of the nuclear force and phenomena in a new scientific regime.

In an attempt to obtain such a plasma, researchers at Brookhaven National Laboratory are accelerating oxygen and silicon nuclei to energies of 14.5 GeV per nucleon. These collisions produce several hundred particles apiece, and detectors of various types are needed to measure them. As expected, experiments to-date have detected no evidence of a QGP, but the data provides confirmation of the underlying theory. This theory predicts that a transition to a QGP may occur at the 14.5 billion electron volts (GeV) per nucleon energy level or perhaps at the higher energies beyond the capability of our present accelerator facilities.

FY 1990 NUCLEAR PHYSICS BUDGET REQUEST

The FY 1990 budget request for the Nuclear Physics program is $299.3 million. Of that total, $205.3 million is for Operating Expenses, $20.0 million is for Capital Equipment, and $74.0 million is for Construction (Tables 5 & 6).

Table 5
General Science and Research
Nuclear Physics
Budget Authority
($ in millions)

	FY 1988	FY 1989	FY 1990 Request
Operating Expenses			
Medium Energy Nuclear Physics	$ 83.5	$ 85.7	$ 93.7
Heavy Ion Nuclear Physics	64.9	67.5	71.5
Low Energy Nuclear Physics	24.7	25.9	27.4
Nuclear Theory	10.5	10.8	12.7
Subtotal	$183.6	$189.9	$205.3
Capital Equipment	$ 17.7	$ 18.5	$ 20.0
Construction	41.5	52.5	74.0
Total Nuclear Physics	$242.8	$260.9	$299.3

Table 6
General Science and Research
Nuclear Physics
Budget Authority
($ in millions)

Construction

Project	TEC	FY 1989	FY 1990 Request
Accelerator Improvements and Modifications (90-R-201)	$ 4.6	$ -	$ 4.6
Accelerator Improvements and Modifications (89-R-201)	4.3	4.3	-
General Plant Projects (GP-E-300)	4.4	-	4.4
General Plant Projects (GP-E-300)	3.7	3.7	-
Continuous Electron Beam Accelerator Facility (87-R-203)	265.0	44.5	65.0
Total Construction		$ 52.5	$ 74.0

The Operating Expenses request will provide for continued research in low and medium energy physics, in heavy ion nuclear physics and in nuclear theory at approximately the FY 1989 level. This request focuses on current problems of scientific and technological interest and on exploitation of major new facilities. Special emphasis will be placed on effective use of the upgraded accelerators at the University of Washington and Yale University, the Argonne Tandem/Linac Accelerator System (ATLAS) superconducting heavy ion facility, and the Tandem/AGS high energy heavy ion beams at Brookhaven. Adjustments have been made within the program to accommodate the increased interest of students and postdoctoral fellows in nuclear physics, to enhance the theory component, and to concentrate the program on the highest priorities and new scientific areas.

The FY 1990 Operating Expenses request also includes $11.2 million for R&D in support of research on advanced detector concepts as well as the next generation of accelerators, including the Continuous Electron Beam Accelerator Facility and a relativistic heavy ion collider facility.

The Capital Equipment request of $20.0 million will improve overall instrumentation for effective use of the research facilities. These funds will provide for such equipment as particle detection systems and data acquisition and analysis systems. The FY 1990 request will also provide for general purpose equipment to meet the laboratory-wide needs of Lawrence Berkeley Laboratory.

The FY 1990 Construction request for Nuclear Physics is $74.0 million. Of that amount, $65.0 million is for the Continuous Electron Beam Accelerator Facility (CEBAF). CEBAF will provide access to the critical transition region between the traditional and emerging descriptions of nuclear matter. The main research tool at CEBAF will be an accelerator with electron beams in the energy range of 0.5 to 4.0 GeV. Its combination of high-energy, high-current, and continuous beam with excellent beam quality is expected to revolutionize the production and collection of data for nuclear physics research.

The FY 1990 Construction funds for CEBAF will be used to begin construction of the experimental area, continue construction of the accelerator enclosure, continue procurement of cavities and cryostats, and begin procurement of arc magnets, power supplies and of experimental equipment.

The Construction request also includes $4.6 million for Accelerator Improvements and Modifications (AIM) and $4.4 million for General Plant Projects (GPP). AIM projects address the need for improvements to research accelerators and related experimental facilities while GPP projects focus on general laboratory facilities. These projects are needed to maintain the scientific effectiveness, reliability, and efficiency of Nuclear Physics facilities.

GENERAL SCIENCE PROGRAM DIRECTION

The FY 1990 budget request for General Science Program Direction is $3.9 million. This request is under the General Science and Research appropriation. The requested funds are required to provide for the salaries, benefits, travel, and other expenses associated with 49 full-time equivalent employees in the Office of High Energy and Nuclear Physics and associated support staff required to administer these programs.

Now let me turn to the programs under the Energy Supply R&D appropriation. The first of these is Basic Energy Sciences.

BASIC ENERGY SCIENCES

The Basic Energy Sciences (BES) program supports the research that provides the fundamental scientific and engineering knowledge needed to underpin advances in DOE's applied technology programs and in industry. In addition to supporting research over a wide range of technical areas, the BES program provides support for the operation of major user facilities such as synchrotron radiation sources, neutron sources, and a combustion research facility. These facilities are national facilities maintained and operated for

the benefit of all qualified researchers from Government laboratories, academia, and the industrial laboratories. These facilities are critical to continued progress in the scientific research supported by the BES program; and they are playing an increasingly important role in research carried out by the private sector.

Currently, BES has seven major facilities built and operating. In the past, the demand for time at these facilities has been greater than the time that could be made available. The FY 1990 budget request, which I will discuss later in this statement, provides a more optimal operating level for these facilities and reflects the program's responsibility to plan for the future by constructing advanced scientific facilities which will provide needed new capabilities for conducting forefront research. The 6-7 GeV Synchrotron Radiation Source, which has been rated as a top priority by several science panels, is just such a facility; and I will discuss it in more detail later in my statement.

BES supports about 1,400 individual research projects conducted by about 4,000 scientists at more than 200 separate institutions. The BES program undertakes research primarily at national laboratories and universities and, to a lesser extent, at private research laboratories and other Government laboratories. Approximately 60 percent of BES-supported research is carried out at national laboratories. Since these laboratories are also involved in many aspects of the applied energy programs, they are skilled at facilitating transfer of scientific information and technology from experiment to application. In addition, the stability of the organization and the specialized capabilities which exist at the laboratories in many instances are unmatched. The BES program also provides significant direct funding support to universities in addition to providing them with research time at the various user facilities located at the national laboratories. BES also provides funding for the supercomputer centers used by other ER investigators as well as BES researchers. All of these BES-supported activities play a major role in training future scientists.

In addition to universities and national laboratories, BES supports research in and maintains strong ties with industry. Representatives from different industries serve on the BES Advisory Committee; experts from industry participate in the review of research proposals and use the specialized facilities sponsored by BES; industrial scientists participate in advisory committees to the national laboratories; and industry representatives are invited to attend BES conferences and workshops on special topics.

The FY 1990 budget request for Basic Energy Sciences is $590.0 million (Table 7). The request includes $470.7 million for Operating Expenses, $37.6 million for Capital Equipment, and $81.7 million for Construction.

Table 7
Energy Supply R&D
Basic Energy Sciences
Budget Authority
($ in millions)

	FY 1988	FY 1989	FY 1990 Request
Operating Expenses			
Materials Sciences	$ 170.4	$ 180.5	$ 202.3
Chemical Sciences	127.2	132.9	147.9
Applied Mathematical Sciences	41.9	42.7	44.9
Engineering and Geosciences	31.0	33.2	34.1
Advanced Energy Projects	14.1	14.5	14.9
Energy Biosciences	20.0	20.6	21.2
Program Direction	4.5	4.9	5.4
Subtotal	$ 409.1	$ 429.3	$ 470.7
Capital Equipment	31.7	31.7	37.6
Construction	116.9	88.3	81.7
Total Basic Energy Sciences	$ 557.7	$ 549.3	$ 590.0

The request for Operating Expenses will allow us to conduct research aimed at uncovering new energy-related information in materials sciences, chemical sciences, applied mathematical sciences, engineering and geosciences, energy biosciences, and advanced energy projects. The funds are necessary to provide for continuation of the core research programs at the present level, expanded research activity in high temperature superconductivity and molecular sciences, and continued operation of the important national scientific user facilities. These funds will also provide for research and development required for further progress on planned new advanced scientific facilities such as the 6-7 GeV Synchrotron Radiation Source, which will provide hard X-rays for frontier research in a variety of areas including the surface characteristics of materials, the structure of biological materials, and angiography.

I would now like to describe briefly some of the research activities and results of each of the major BES subprograms. In FY 1990, research in Materials Sciences will continue to increase our understanding of the properties and behavior of materials. Materials often are the limiting feature in energy systems because they often prevent higher temperatures and efficiency and shorten the lifetime of systems. Conversely, advances in materials frequently provide new opportunities, which can ultimately result in entirely new technologies, such as high temperature superconducting instruments and electrical machinery. These technologies in turn depend on the discovery and development of suitable superconducting materials.

BES-supported Materials Sciences research concentrates on selected areas of importance and on areas where problems are known to exist or are anticipated. Some research may relate to a single energy technology (such as research on photovoltaic materials for converting solar energy to electricity); some applies to many technologies (such as research on corrosion mechanisms in materials); and still other work has more fundamental implications for all materials research (such as research on interfaces in solids and computer modeling of materials phenomena).

During the past year, Materials Sciences continued to make substantial progress on the new high temperature superconductors. Researchers at Argonne National Laboratory were able to isolate a pure compound in the bismuth-strontium-calcium-copper-oxygen mixture which was superconducting at a temperature of -163 degrees Centigrade. Previously, similar results occurred at temperatures of up to only -188 degrees Centigrade. This was also an especially noteworthy achievement because this compound does not include any of the expensive rare earth elements.

In another accomplishment related to superconductivity, scientists at Sandia National Laboratories successfully prepared the first thin films of the new thallium-based superconducting materials and showed that they can carry high critical currents which are not easily destroyed by a magnetic field. This is important because the goal is to achieve sufficiently high currents without exceeding the critical level, because to do so would eliminate the superconducting effect.

Synchrotron radiation sources and neutron sources supported by BES continued to be used by the national scientific community to determine the structure of the many high temperature superconductors which have been discovered. Other advances in Materials Sciences included work on enhanced methods for forming structural ceramics, a class of materials which have potential for use in such applications as automobile engines. Researchers also developed computer models of structural features called grain boundaries, which often are the weakest area in a material.

In Chemical Sciences, research supported in FY 1990 will continue to expand our knowledge, with a long-term goal of creating new or improved processes for using and converting energy resources. The focus of the research is on the chemical properties of matter and the interactions of the component molecules, atoms, ions, and electrons. Research in some areas, such as chemical catalysis, where scientists seek a better understanding of why some molecules uniquely promote specific chemical reactions, may be quickly exploited by industrial process designers. Research in other areas, such as the use of light-induced chemical reactions to produce hydrogen from water decomposition, may not find practical application for a number of years. Still other research areas, such as the study of the interactions of atoms and electrons with plasmas, may produce knowledge important in the development of entirely new energy technologies.

Chemical Sciences research ultimately affects such areas as production of fuels and chemicals from coal, nuclear waste separation, conversion of biomass (such as wood and leafy materials) into liquid fuels using enzymes or micro-organisms, and detection and measurement of harmful byproducts of energy processes. One research area that will continue to receive emphasis in FY 1990 is coal science. Scientists are working to understand the structure and chemical reactivity of coal. Such understanding will aid in developing new ways of transforming coal into synthetic gaseous or liquid fuels. A second principal focus in FY 1990 will be on combustion. With world energy production still overwhelmingly based on fossil fuels, control and reduction of pollution depends largely on improving the efficiency with which such fuels are burned. To do this requires a broad and basic understanding of the complex process of combustion. The FY 1990 Operating Expenses request will also provide for the study of heavy elements and the production and separation of heavy radioactive elements. These latter areas are of great importance to radioactive waste disposal programs.

During the past year, research in Chemical Sciences demonstrated for the first time a new measuring technique which is capable of providing direct information about the structure of molecules on surfaces. Also, scientists have confirmed a theory concerning the existence of the Antarctic ozone hole which improves our understanding of the effects of chemical pollutants on changing atmospheric conditions. Other accomplishments include development of new, high-power lasers for use in scientific research, improved models for predicting the behavior of coal solutions, and the discovery of a new method of using electric fields to stir liquids in chemical separations processes, thus increasing the efficiency of extracting the desired chemical and significantly reducing energy consumption.

Research in Engineering and Geosciences encompasses two broad disciplines. The first, engineering research, aims to enlarge our knowledge of the processes and concepts that underlie current engineering practice in energy technologies. Although fundamental engineering research is aimed at long-term goals, important near-term applications have emerged from the work supported. For example, the Department has supported research into new optical theories that aim to maximize the intensity of light over an area, rather than to produce a sharply focused image. Such theories recently have allowed the Department's solar energy program to construct solar furnaces that concentrate the sun's light by 50,000-fold, a tripling of previous performance. This gives light intensity nearly equal to that at the sun's surface. One possible application is to power lasers for communication from satellites. The increased intensity now possible would reduce the problem of energy losses encountered when sunlight is converted to electricity.

Research in geosciences contributes to a better understanding of the energy-related aspects of geological, geophysical, and geochemical processes related to the earth. Several geoscience research projects that will continue in FY 1990 involve advanced methods for remote sensing and measurement of the properties of earth materials as well as direct scientific drilling to study the thermal zones of the earth and those bearing fossil fuels. For example, high resolution underground acoustic imaging is being developed to illuminate, in detail, the characteristics of groundwater and petroleum reservoirs.

In another geosciences project, drilling was started in July 1988 in the Valles Caldera, New Mexico, on the tenth Continental Scientific Drilling Project funded by DOE. This 5,780-foot hole is now complete and is the deepest fully cored hole in a geothermal area thus far drilled in the United States. The project, which will continue in FY 1990, will study boiling, heat transfer, and ore deposition in thermal zones of the earth.

Applied Mathematical Sciences supports long-range mathematical and computational research. Computational methods provide insights into experimental data and simulate ideal experiments for testing analytical models. This subprogram advances all aspects of scientific computation--from proofs of theorems about mathematical equations to understanding the structure of parallel computer systems.

In 1988, scientists at Sandia National Laboratories in Albuquerque discovered new methods for solving complex scientific problems at unprecedented speeds. They developed innovative methods for parallel computing for the 1,024-processor hypercube computer at Sandia and demonstrated speedups over single-processor computing near the theoretical limit on full-scale applications in wave propagation, solid mechanics, and fluid flow research.

In addition to supporting mathematical and computational science research in FY 1990, Applied Mathematics Sciences will provide access to scientific supercomputers which are essential for researchers supported by the Office of Energy Research in high energy and nuclear physics, basic energy sciences, and biological and environmental research.

Energy Biosciences research in FY 1990 will continue to increase our understanding of basic biological principles, biological mechanisms, and organisms useful for energy applications, such as the production of fuels from biomass materials. Other possible applications include biological processes that might substitute for energy-intensive activities, such as fertilizer production, and biological means of resource recovery, such as the extraction of copper from ore through leaching. This research activity consists principally of research in the plant and microbial sciences.

One recent research accomplishment concerns a small plant, Arabidopsis, that is having a profound effect on plant science research since recent DOE-supported research showed how easily mutations in the plant could be induced, recognized and employed for studying many different plant processes. As a result, Arabidopsis is now the most commonly used plant system for basic biological research. The studies are done using molecular biological techniques. The most important aspect of this discovery is the ability it gives us to identify and subsequently transfer genes having agronomic importance from Arabidopsis to certain crop plants. An example of this would be the transfer of herbicide resistance genes. Ultimately, the biotechnology industry may be able to take advantage of this ease of mutation to produce much improved plants.

The results of microbiological research about fermentations, plant-microbe interactions, and the microbial degradation of plant material will be the foundation of new biosystems capable of producing fuels and chemicals. Bacteria may be able to do work now done by energy-consuming industrial processes. Recent studies in this direction have involved sulfate-reducing bacteria that convert the sulfur in sulfuric acid to hydrogen sulfide. Recently, scientists have discovered a virus that can transfer genetic material between different strains of these sulfate-reducing bacteria. This opens up the possibility of tailoring these bacteria to perform such tasks as removing sulfates from waste streams. Genetically altered, sulfate-reducing bacteria provide insights into bacterial conversion processes applicable to many industrial applications, to bacterial-induced corrosion processes and to preservation of oil wells, where hydrogen sulfide production interferes with drilling operations and ultimately in the oil refining process itself.

The main objective of Advanced Energy Projects is to explore the feasibility of novel energy-related concepts evolving from basic research that are at an early stage of scientific definition and therefore not yet of practical use to technology programs. Although these concepts involve a high degree of risk, they have the potential for high payoffs. Thus, Advanced Energy Projects fills a void, encouraging the transition of basic research results into technological applications. It also supports exploratory projects that do not precisely fit into any single program area but that have broad potential applications.

Recently a small company, ParaMagnetic Logging, Inc., which is supported by Advanced Energy Projects, established the feasibility of a new technique to be used for locating oil and gas deposits overlooked in existing reservoirs. Previously, it had been impossible to systematically locate such deposits without drilling expensive new holes. The oil and gas industry now uses measurements of the electrical resistivity of geological formations to determine the presence of oil and gas in newly drilled holes. However, such measurements have been impossible to make through steel pipes that surround wells in existing older oil fields. The company has developed a new technique that will allow such measurements to be made, thus resulting in the detection of "missed oil" and "by-passed gas." This technology has the potential to significantly increase the proved oil reserves within the United States.

Advanced Energy Projects also supports research on heavy-ion accelerators aimed at validating this technology as an inertial fusion driver. Heavy-ion beams could be the ultimate choice for generating energy from inertial fusion if issues associated with accelerating beams to the required intensities are successfully resolved with cost-effective accelerator designs. Scaled experiments aimed at addressing these issues are underway and will be continued.

As I mentioned earlier, the operation of major user facilities is a very important part of the BES program. At the present time, BES has seven major facilities: the National Synchrotron Light Source (NSLS) at Brookhaven National Laboratory (BNL); the Stanford Synchrotron Radiation Laboratory at Stanford University (SSRL); the High Flux Beam Reactor (HFBR) at BNL; the High Flux Isotope Reactor (HFIR) at Oak Ridge National Laboratory; the Intense Pulsed Neutron Source (IPNS) at Argonne National Laboratory; the Los Alamos Neutron Scattering Center at Los Alamos National Laboratory; and the Combustion Research Facility at Sandia National Laboratories (Livermore). It is important to keep the facilities operating at levels which are responsive to the demand for their use; and the FY 1990 budget request is consistent with this goal.

During the past year, many new and interesting results have come out of research at these facilities. For example, at SSRL, synchrotron radiation was demonstrated to be effective in imaging the coronary artery circulation of human subjects. Clinical research in this area will now move to the NSLS because of the higher flux of radiation available there. Also at the NSLS, lithography experiments by IBM have led to full-scale working computer chips with feature sizes as small as one-half micron, which is one thousandth of a millimeter. The success of these has made synchrotron radiation a leading candidate for fabricating computer chips with feature size at or below one-half micron. At the IPNS and the HFBR, neutrons were used to uncover the structure of the new high temperature superconductors.

The BES Capital Equipment request for FY 1990 is $37.6 million. These funds will ensure that BES-supported researchers will continue to have the equipment needed to initiate and continue advanced research, much of which involves experiments at extremes of temperature and pressure. Reliable, precise measurements under these conditions challenge the current state-of-the-art. Replacements and new equipment funded under this request, which are important to the continued success of the program, include such items as electron microscopes, neutron spectrometers, molecular beam equipment and computers for equipment control and data analysis.

In addition to its seven facilities, BES is constructing advanced scientific facilities which are critically needed by the scientific community. A substantial part of the FY 1990 construction request of $81.7 million for BES (Table 8) is for the 1-2 GeV Synchrotron Radiation Source at Lawrence Berkeley Laboratory and the 6-7 GeV Synchrotron Radiation Source at Argonne National Laboratory. Both facilities are needed to cover the entire radiation range needed for experiments supported by the program. The 1-2 GeV project is a third generation light source in the vacuum ultra violet/soft x-ray range. The FY 1990 request includes $26.0 million for this project, for which construction was begun in FY 1987. The 6-7 GeV project is a new hard x-ray synchrotron light source which has been rated as top priority by several science panels, including one from the National Academy of Sciences and one from the DOE Energy Research Advisory Board. Funding for design only was included in the FY 1989 appropriation. The FY 1990 Construction request includes $40.0 million for initial construction.

Table 8
Basic Energy Sciences
Construction Summary
($ in millions)

Project Title	FY 1989	FY 1990 Request	TEC
Neutron Scattering Experimental Hall (LANL)	$ 4.0	$ 0	$ 17.5
1-2 GeV Synchrotron Radiation Source (LBL)	25.0	26.0	99.5
3 GeV SPEAR Injector (SSRL)	6.5	4.5	14.0
6-7 GeV Synchrotron Radiation Source (ANL)	6.0	40.0	456.0
General Plant Projects	4.9	5.6	5.6
Accelerator Improvement Projects	2.3	4.6	4.6
Partial Decontamination and Medium Term Protective Storage of the ANL CP-5 Research Reactor	0	1.0	5.4
Congressionally Initiated University Projects	39.6	0	0
Total Basic Energy Sciences Construction	$ 88.3	$ 81.7	

MAGNETIC FUSION ENERGY

The continuing goal of the Magnetic Fusion Energy program is to establish the scientific and technological base required for an assessment of the feasibility of magnetic fusion as an energy source. Fusion as a source of energy is attractive for several reasons. The fusion fuels (deuterium and tritium) are easily obtained and virtually inexhaustible. In addition, fusion reactors can be designed to yield very little long-lived radioactive waste. Finally, fusion powerplants would have outstanding safety features because there are only small amounts of relatively low-hazard fuel present at any one time and the fusion reaction could not run out of control.

The greatest challenge in producing fusion energy for practical use is to develop a device that can heat the deuterium-tritium fuel to the required high temperature and confine the heated fuel long enough so that more energy is released in the fusion reactions than is used to heat the fuel. The Tokamak Fusion Test Reactor (TFTR) goal is to confine the fuel at high temperatures long enough to achieve "breakeven" condition--where the fusion energy released is equal to that required to heat the fuel. Beyond breakeven, the next major step in the fusion program will be to achieve ignition, the condition in which the fusion reaction products take over the heating of the plasma and the plasma begins to burn without external heat sources. Once ignition has been achieved, the next goal will be a long pulse, or steady-state, burn and technology development.

The program called for by the Department's strategy, and further defined in the Magnetic Fusion Program Plan of 1985, includes work on each of four key technical issues: the properties of burning plasmas, magnetic confinement systems, fusion materials, and fusion nuclear technology. Although the Fusion program supports work aimed at addressing each of the key technical issues, the FY 1990 budget request gives highest priority to the first two. This will include strengthened experimental and theoretical efforts in high leverage areas of research on tokamak confinement and burning plasma physics. Improved understanding of tokamak confinement and burning plasma physics will help to advance the program more rapidly and is expected to reduce the cost of the development of fusion energy.

Let me take a moment to comment on the four key technical issues. The first of these concerns the properties of burning plasmas. No experimental facility exists anywhere in the world to investigate burning plasmas. The present Compact Ignition Tokamak (CIT) proposal is a two-phase experimental attempt to attain ignition in a modest-size device and to study and optimize fully ignited plasmas, should they be attained. The proposed device makes use of equipment and facilities at Princeton Plasma Physics Laboratory to reduce the cost of CIT. The existing design, which uses only existing TFTR power supplies, does not assure ignition. The probability of ignition, based on empirical global scaling laws for confinement, is reasonable, particularly with the ability to add additional power supplies if warranted. I have requested that a review be conducted to examine the prospects for ignition, including the need for additional power supplies. We will provide the results of this review, including implications for the budget, in the near future.

All the qualitative features known to improve confinement (high magnetic field, high current, high plasma density, discharge shaping, etc.) are exploited in the CIT device. There is, therefore, a consensus throughout the fusion community that a device of this general type should be built. Efforts are underway to increase the ultimate capability of the device and to better specify the need for any additional power supplies or heating systems. Thus, the general parameter region for the device is known, and necessary R&D on magnet design is proceeding. The FY 1990 budget request, which I will discuss in a moment, includes funds for both R&D and initiation of construction activities.

The second key technical issue concerns magnetic confinement systems. Significant progress continues to be made in understanding the processes involved in confinement. During the past year, improved confinement in tokamaks has been extended. New confinement conditions were achieved in TFTR at Princeton Plasma Physics Laboratory and DIII-D at General Atomics. Additional confinement improvements were observed in the Joint European Torus (JET), ASDEX in West Germany, and JT-60 in Japan (up to a factor of 3) compared to previous results. Nevertheless, there is a pressing need to improve our understanding of the physics mechanisms controlling energy confinement. To improve our ability to produce, heat, and control the requisite plasmas, the FY 1990 budget request provides for the application of recently developed experimental and theoretical capability to the physics mechanisms controlling energy confinement because this information is critical for planning for CIT and could reduce the size and cost of future steps in fusion development.

The third key issue concerns the identification and testing of materials for fusion systems. Achievement of the program goal will require development of new materials to reduce the induced radioactivity and, thereby, enhance the economic and environmental potential of fusion. Materials research is being pursued through cooperative international agreements that provide significant foreign contributions toward the operation of U.S. research facilities for mutual benefit. The FY 1990 budget request supports the core research program needed for U.S. participation in this international effort.

Advances in the basic engineering sciences will be required to address the fourth key technical issue, the nuclear technology of fusion systems. For this issue to be resolved, fuel-producing blankets must be integrated into other fusion systems and tested in a nuclear environment. These fusion blankets perform several functions, including converting the energy released by a fusion reaction into useful energy, creating the tritium fuel for the reactor, and allowing for recovery of this fuel, as well as shielding critical components from radiation. The FY 1990 budget request supports selected basic technology research that underlies the development of blankets for a fusion engineering test reactor.

Research carried out by the U.S. Magnetic Fusion program on the four key technical issues constitutes the basis for our participation in the world fusion program. This participation continues a long history of scientific exchange and cooperation. The most significant current international cooperative effort is that aimed at developing a single conceptual design for an International Thermonuclear Experimental Reactor (ITER). The ITER device would, if built, be the follow-on to CIT that allows for the study of sustained ignition and burn physics. This device would also be used for the technology development necessary to lay the foundation for the design and construction of future devices. This effort, carried out under International Atomic Energy Agency auspices, includes the U.S., the USSR, Japan, and the European Community. After preliminary work and negotiation in 1987, the joint design effort began on April 21, 1988. The FY 1990 budget request provides for continuing U.S. participation in the conceptual design and validating R&D at the level of $16 million per year per party. Therefore, over the three years of the ITER effort, approximately $192 million of effort will be devoted by the four parties to the preliminary design and supporting research and development. Once the design is complete, each participating country will have the information needed to make its own decisions regarding a future ITER-type facility.

FY 1990 MAGNETIC FUSION ENERGY BUDGET REQUEST

The FY 1990 budget request for Magnetic Fusion Energy is $349.2 million. This request includes $307.9 million for Operating Expenses, $13.2 million for Capital Equipment, and $28.1 million for Construction (Table 9). This budget request provides for high priority research based on increased use of existing tokamaks, application of additional diagnostic equipment to existing devices, and increased efforts on development of a more attractive heating technique.

Table 9
Energy Supply R&D
Magnetic Fusion Energy
Budget Authority
($ in millions)

	FY 1988	FY 1989	FY 1990 Request
Operating Expenses	$295.7	$316.7	$307.9
Capital Equipment	18.7	21.6	13.2
Construction	16.9	12.4	28.1
Total	$331.3	$350.7	$349.2

Let me now summarize the Operating Expenses request for each of the interrelated functional areas within the Magnetic Fusion Energy program: Confinement Systems, Applied Plasma Physics, Development and Technology, Planning and Projects, and Program Direction (Table 10).

Table 10
Energy Supply R&D
Magnetic Fusion Energy
Budget Authority
($ in millions)

	FY 1988	FY 1989	FY 1990 Request
Operating Expenses			
Confinement Systems	$159.6	$174.8	$168.1
Applied Plasma Physics	74.7	78.2	73.2
Development and Technology	55.9	54.1	56.7
Planning and Projects	0.9	5.0	4.9
Program Direction	4.6	4.6	5.0
Subtotal	$295.7	$316.7	$307.9
Capital Equipment	18.7	21.6	13.2
Construction			
Compact Ignition Tokamak	8.0	3.5	5.5
General Plant Projects	8.9	8.9	9.3
Confinement Physics Research Facility	0	0	13.3
	$ 16.9	$ 12.4	$ 28.1
Total	$331.3	$350.7	$349.2

The Confinement Systems subprogram, with an FY 1990 Operating Expenses request of $168.1 million, addresses the two high priority technical issues for the Fusion program--improving magnetic confinement systems and determining the properties of burning plasmas. This research is focused on tokamaks and involves developing the data base needed to prepare for a burning plasma experiment and to identify an improved confinement system. The primary scientific issues being addressed by this research are energy confinement, heating, plasma stability, current control, and physics and particle control at the edge of a plasma.

In FY 1990, research will be conducted on several toroidal devices to investigate these physics issues and to prepare for performing the burning plasma physics experiments on TFTR and CIT. The confinement of high temperature plasmas will be studied on TFTR at the Princeton Plasma Physics Laboratory. Preparation for operation with deuterium-tritium fuel will be delayed to allow continued operation of TFTR to focus experiments on confinement in the world's hottest tokamak. To aid in the study of confinement physics, improved diagnostics will be installed for these experiments. The Operating Expenses request also includes $15 million for R&D related to the CIT project.

A number of medium-sized toroidal devices will be operated to help improve our understanding of how to produce, heat, and control the plasma required for fusion energy. Scientists at the DIII-D device at General Atomics have made steady progress in determining the upper limits of a parameter called "beta," which is the ratio of plasma energy to magnetic energy. In 1988, a world record beta of 6.8% was achieved. Scientists at DIII-D will continue to explore alternate plasma shapes and operating modes predicted to increase beta, while also extending understanding of confinement obtained through magnetic field shaping.

Fabrication of the Alcator-C Modification at the Massachusetts Institute of Technology (MIT) will be completed in FY 1990. This experiment will test various aspects of the CIT design, physics assumptions, and projected operating modes. The Microwave Tokamak Experiment (MTX), at Lawrence Livermore National Laboratory, which was fabricated using the old Alcator-C device from MIT, began operating in FY 1989. It provides the unique capability to test the application of pulsed high power microwaves as a more efficient heating technique in tokamak devices.

Two devices are currently operating to study advanced toroidal issues. These devices are the Advanced Toroidal Facility (ATF) at the Oak Ridge National Laboratory and the Princeton Beta Experiment (PBX) at the Princeton Plasma Physics Laboratory (PPPL). These devices are conducting experiments to determine the existence of a second stability regime and determine the plasma physics requirements for operating with high performance and improved stability. The Advanced Toroidal Facility, which is a stellarator type device, is also looking at the issues of stability, transport, heating and particle control in this type of device. As the program continues to focus on tokamak confinement physics in FY 1990, operation of ATF will continue, but on a half-time basis. The PBX facility, although valuable in the long run, will be mothballed in FY 1990 while resources at PPPL are focused on TFTR and CIT.

International collaboration will be relied on to carry out research on a number of related plasma issues in foreign facilities, including TEXTOR and ASDEX in West Germany, Tore Supra in France, the JET in Europe, and JT-60 in Japan. In each of these cases, the U.S. provides technical personnel and specialized equipment in return for participation in the planning and conduct of the research and sharing of the results.

The Applied Plasma Physics (APP) subprogram, with a FY 1990 budget request of $73.2 million, plays a major role in addressing the magnetic confinement and burning plasma issues at a very fundamental level. The subprogram conducts research on basic magnetic confinement physics, develops information on new diagnostic techniques and techniques to heat and control plasma, and provides computational support for the overall program.

In FY 1990, APP will continue to expand our understanding of magnetically confined plasmas through experiments with alternative magnetic configurations, including tokamaks, compact toroids, and reversed field configuration devices. These configurations provide different physical environments in which magnetically confined plasmas obey the same overall physics laws governing plasma stability as well as transport of energy and particles within the plasma. The Texas Experimental Tokamak (TEXT) at the University of Texas provides a center for investigating the basic physics of the transport of particles and energy within plasma and for developing diagnostics. Other, small, university plasma devices test new ideas on current drive and heating or test specific theoretical predictions. Research with non-tokamak configurations includes: (1) design of a major reversed field device, the first concept to be tested in the Confinement Physics Research Facility at the Los Alamos National Laboratory; (2) operation of a new reversed field device at the University of Wisconsin to investigate edge physics issues in reversed field configurations; (3) completion and first operation of a field reversed device at Spectra Technology with supporting work at the University of Washington; and (4) spheromak physics research at the University of Maryland and at the University of California Berkeley.

In FY 1990, theoretical research will refine predictions of alpha particle physics in burning plasma, continue to develop predictive capability for radio frequency heating, and emphasize predictions and modeling of processes controlling the transport of energy and particles in toroidal plasma. Large scale computational needs are provided through the operation of the Energy Sciences computing network.

The Development and Technology subprogram, with a budget request of $56.7 million, develops components and systems for use in near-term and mid-term fusion experiments, and conducts research and development on long-term generic materials and fusion nuclear technology. This subprogram also performs conceptual design studies for future fusion devices. These studies identify component and system development needs that must be met to prepare for the eventual application of fusion. The international collaborative program, ITER, is funded from this subprogram.

In FY 1990, this subprogram will continue to pursue research on technologies needed to form, contain, heat and sustain a reacting fusion plasma. Development of higher field capability superconducting magnets will be continued to help reduce the plasma physics needs and reduce the size and cost of fusion reactors. The heating and fueling systems developed to date have enabled the production of record plasma conditions in fusion devices, and this U.S. technology is valued highly in the development of agreements for collaborative work internationally. Fueling the plasma with pellet injectors, which are funded from this program, is instrumental in achieving density profiles in plasmas which produce better confinement. The heating systems developed in the technology program are being used to achieve temperatures in present devices and are being improved to do the same in larger fusion devices.

Materials research will continue to develop low-activation materials that will reduce the need for long-term waste disposal and limit materials damage due to the bombardment of neutrons and plasma inside the fusion reactor. In this regard, Oak Ridge National Laboratory achieved significant progress in 1988 in the development of a reduced activation structural alloy for the ITER design. Technologies needed for various blanket concepts will also be investigated for their ability to perform the multiple functions of heat extraction, tritium production, and radiation shielding. Finally, design and R&D work will continue in support of ITER and in particular on the power handling and particle control issues.

The Planning and Projects subprogram primarily provides support for construction of major new facilities and fabrication of auxiliary components for these facilities. The FY 1990 Operating Expenses request of $4.9 million is primarily for compliance with requirements associated with the Small Business Innovation Research program.

The Operating Expenses request of $5.0 million for Program Direction provides for personnel and other costs associated with continuation of 62 full-time equivalent staff.

The FY 1990 Capital Equipment request of $13.2 million will provide for essential hardware to support the overall program. This equipment includes diagnostic and computer equipment, power supplies, and other components for experimental facilities.

The FY 1990 Construction request of $28.1 million provides $13.3 million for the Confinement Physics Research Facility (CPRF) at Los Alamos National Laboratory. CPRF is being proposed as a line-item construction project for the first time in FY 1990. The project was funded as an Operating Expense project through FY 1989. With a total estimated cost (TEC) of $75.6 million and an estimated completion date of FY 1993, the CPRF will bring to the program an experimental capability to explore the physics properties of a reversed field toroidal confinement experiment that has the theoretical capability, in a future device, of heating the plasma to ignition with lower magnetic fields. The FY 1990 request will support fabrication of the coils and vessel/shell.

The FY 1990 Construction request also includes $5.5 million for the Compact Ignition Tokamak. The project, with a TEC of $455.0 million, began in FY 1988 and is scheduled for completion in 1996. FY 1990 activity in support of the CIT will include detailed design of CIT systems and conventional facilities, long lead procurements for tokamak components, and initiation of site preparations.

The remainder of the Construction request, $9.3 million, is for General Plant Projects (GPP). These GPP projects at Los Alamos National Laboratory, Princeton Plasma Physics Laboratory, and Oak Ridge National Laboratory provide for the continuing minor alterations and modifications necessary to protect the government's investment in its facilities.

BIOLOGICAL AND ENVIRONMENTAL RESEARCH

The Biological and Environmental Research (BER) program develops the knowledge needed to identify, understand, and anticipate the long-term health and environmental consequences of energy use and development. Another objective of the program is to use the Department's unique scientific and technological capabilities to solve major scientific problems in medicine and biology.

To achieve these objectives, the BER program supports research in a number of areas, including biology and life sciences; nuclear medicine; environmental sciences, including carbon dioxide and global change-related research; as well as research to develop advanced measurement techniques used in research throughout the program. The FY 1990 budget request for BER is $271.4 million (Table 11). Funding by research area is shown in Table 12. Of that amount, $255.4 million is for Operating Expenses, $12.5 million is for Capital Equipment, and $3.5 million is for Construction. I would like to comment on each of the research areas provided for in this request.

Table 11
Energy Supply R&D
Biological and Environmental Research
Budget Authority
($ in millions)

	FY 1988	FY 1989	FY 1990 Request
Operating Expenses	$202.4	$225.0	$255.4
Capital Equipment	8.5	9.0	12.5
Construction	56.2	23.5	3.5
Total	$267.1	$257.5	$271.4

Table 12
Energy Supply R&D
Biological and Environmental Research
Budget Authority
($ in Millions)

	FY 1988	FY 1989	FY 1990 Request
Operating Expenses			
Late Effects on Health & Environment of Energy Development and Use			
Analytical Technology	$ 15.2	$ 14.8	$ 16.2
Environmental Research	31.1	36.6	43.6
Health Effects	66.2	69.3	72.2
General Life Sciences	38.4	46.1	60.4
Medical Applications			
Medical Applications	24.1	30.2	32.3
Boron Neutron Capture Therapy at INEL	9.8	6.4	5.3
Carbon Dioxide Research	13.6	17.6	20.8
Program Direction	4.0	4.0	4.6
Subtotal	$202.4	$225.0	$255.4
Capital Equipment	8.5	9.0	12.5
Construction	56.2	23.5	3.5
Total	$267.1	$257.5	$271.4

The biological research carried out under the Health Effects activity is aimed at providing a sound data base for evaluating human health risks, such as cancer and genetic effects, that could result from chronic, low-dose exposures to energy-related environmental agents, such as ionizing radiation and toxic chemicals. This research includes epidemiological, laboratory animal, cellular, and molecular level studies. The FY 1990 request of $72.2 million will provide for increased emphasis on molecular-level studies and research to correlate the relationships between exposure to chemicals or radiation and the consequent biological response. The FY 1990 request will also allow us to extend ongoing health surveillance studies of DOE workers to additional facilities. Research in FY 1990 will emphasize chemical and physical characterization of potentially significant DNA damage from high linear energy transfer radiation, such as alpha and neutron radiation.

Our growing knowledge in the Health Effects area will help us to better understand such important topics as the possible hazards of indoor radon exposure. The radon research program was begun in 1987 to study this major national public health concern. Now composed of 60 projects carried out at various academic institutions and national laboratories, the program will continue to emphasize the basic scientific research needed to understand and predict the health risk related to exposure to indoor radon. This research includes measuring the exposure to radon more accurately, better defining health risk estimates, and determining the role of radon exposure in combination with smoking in causing lung cancer.

The FY 1990 request for General Life Sciences research of $60.4 million will emphasize molecular and cellular studies to examine how key biological processes operate. With this knowledge, researchers can learn more about how physical and chemical agents affect living processes. The research also identifies early indicators of biological damage, teaches us how cells repair themselves, and leads to new techniques for analyzing biological damage. Ultimately, we hope to understand the basis for individual sensitivity to radiation and environmental chemicals, and to have the technology and data base to define risks and allow the establishment of improved health protection standards.

In FY 1990, a major focus in General Life Sciences research will be in molecular genetics to reveal DNA damage and repair mechanisms and to understand the human genome--the complete set of genetic instructions that make a human being. The Department's human genome effort is focused on developing new instrumentation and methodologies that will make such research far less costly to perform per fragment of DNA identified, as well as far less labor intensive. New insight is likely to come from a recent achievement by BER-supported investigators at the Massachusetts Institute of Technology. The new technology developed there permits production of many copies of damaged DNA, resulting in the capability to rapidly detect mutational changes with an error rate of one in a billion, and thus provides unprecedented sensitivity in quantifying DNA damage in people exposed to hazardous chemicals and radiation.

One important byproduct that results from all the areas of BER research is the development of instrumentation. During the early stages of science, observation with available instruments is usually sufficient. However, at some point, it becomes necessary to measure events that have not been measured before. New technologies often result in new, more efficient, or more cost effective instruments that find applications outside the original thrust of the research. For example, the flow cytometer, developed initially to sort and count blood cells, has been improved progressively to the point where it now quickly isolates relatively pure samples of each of the individual chromosomes, thus, providing important technologies for the human genome project. In another significant advance, a team of scientists from the Lawrence Livermore National Laboratory and the Lawrence Berkeley Laboratory has used the scanning tunneling microscope to obtain the first direct images of unaltered double-stranded DNA. Extensions of this work could have major ramifications for molecular biology and research on biological structures.

Coordination of the human genome research and technical activities between DOE and the National Institutes of Health was formalized in a 1988 Memorandum of Understanding, which provides for a joint advisory committee and an interagency working group. Research on the human genome at Los Alamos and Lawrence Livermore National Laboratories and Lawrence Berkeley Laboratory will build upon the considerable progress already made in developing the intellectual and physical resources (including engineering, computational and biomedical expertise) for genome analysis. For example, the molecular nature of chromosome ends and centers has been identified, contributing substantially to our ability to map chromosomes. In addition, libraries of cloned DNA have been prepared, and an automated system is now rapidly processing the DNA in one chromosome-mapping effort. The FY 1990 request of $27.6 million for the genome activity, up from $17.5 million in FY 1989, provides for an expanded effort which will include initiating physical mapping efforts for chromosomes where this is not already underway, testing new approaches for mapping, and providing necessary support to DOE Human Genome Centers and other large interdisciplinary efforts. Pilot sequencing projects will also be initiated to evaluate and compare new sequencing technologies. The proposed level of effort will enable the Department to maintain its momentum in the area of developing new tools and methodologies which will greatly increase the pace and lower the cost for mapping and sequencing the human genome.

The FY 1990 request for the Analytical Technology activity is $16.2 million. This request will provide for research directed at developing new and more sensitive instruments to make physical, chemical and biological measurements of energy-related emissions. These instruments will also assist scientists in measuring human exposure and biological response to those emissions.

Over the years, the Department's Medical Applications research has been at the forefront of important medical discoveries and has provided information that has led to the widespread use of nuclear technology in modern clinical and laboratory medicine, opening avenues of diagnosis and treatment that otherwise would not have been available. The FY 1990 budget request of $37.6 million will allow research to continue on the development of new radioisotopes, clinical procedures, and instrumentation.

The effort in boron neutron capture therapy (BNCT) has been greatly expanded in the last two years. An effort is currently under way to develop BNCT for the treatment of brain tumors and melanomas. This method is based on the fact that the reaction of an isotope of boron with neutrons produces a nuclear reaction that provides a form of highly localized radiation. When used with boron compounds that selectively concentrate in tumors, this method may make it possible to deliver therapeutic doses of radiation to a tumor with minimal effects on adjacent healthy tissues. Ongoing laboratory research is aimed at providing the data base necessary to determine whether this type of therapy can reasonably be expected to be successful with patients.

The development and use of radiopharmaceuticals in metabolic studies is another major aspect of the program. Radiopharmaceuticals are radioactively labeled compounds that concentrate in certain body organs and can be imaged with sensitive radiation detectors to make the body's internal organs visible to medical diagnosticians. Changes in the spatial and temporal distributions of the labeled substances allow diagnosis to be made without invasive procedures such as biopsy. Radiopharmaceutical research emphasizes studies of brain and heart metabolism, but also contributes to diagnosis and therapy involving other organs. The FY 1990 request also provides for clinical feasibility research which includes testing of new radiopharmaceuticals in animals and, subsequently, in selected patients. This effort evaluates methods for studying, diagnosing, and treating diseases such as cardiopulmonary disease, mental disorders, cancer, and metabolic disorders.

Research will also continue in FY 1990 on the advanced instrumentation required to diagnose and treat patients using nuclear medicine. This research emphasizes advanced detector studies, improved resolution of Positron Emission Tomography (PET) and other imaging techniques, and innovative applications of energy-related technology for noninvasively studying the functioning and condition of internal organs. Recently, in this area, the development of a new and unique PET system has been completed. PET imaging is a method for studying the metabolism of radioactively labeled substances in selected parts of the body by tracking the radioactivity of the label. The new system significantly improves the quality of the computed images and makes it possible to acquire an essentially three-dimensional picture of an area as large as a human heart. This new PET system will be used to study blood flow in the heart and may be able to detect coronary artery disease before clinical symptoms appear. It can also help to diagnose the focal points in the brain that cause seizures in children and distinguish among the different kinds of mental degenerative diseases. In FY 1990, research will continue to develop a technique called high field nuclear magnetic resonance spectroscopy for studying metabolic functions in organs. If successful, it would allow the diagnosis of metabolic disorders of organs such as epilepsy and dementias. Research will also focus on using synchrotron radiation for a safer coronary angiography test which would be used to study the development of atherosclerosis before it has become severe enough to cause a heart attack.

The FY 1990 budget request for Environmental Research is $43.6 million. Another $20.8 million in Operating Expenses and $1.5 million in Capital Equipment is requested for the Carbon Dioxide research activity. Together, these research activities provide information needed to address a number of important issues, including acid rain, global climate processes, the resiliency of ecosystems and marine coastal areas to energy activities, and management of energy and weapons related radiation wastes.

The request for Environmental Research will provide for continued research aimed at determining how energy-related agents move through and are changed by the atmosphere, oceanic and terrestrial ecosystems, and how they ultimately affect humans. Scientists are also looking at how the environment itself may be affected and how negative effects can be mitigated.

An increased research activity in FY 1990 will be aimed at developing basic scientific theories about the interrelationships between atmospheric and terrestrial systems (e.g., plants, water, soil, and air). In the future, we plan to test these theories in natural environments, primarily at the Department's National Environmental Research Parks. The information gained through a combination of theory and experiments will contribute to a better understanding of global change processes.

An ongoing effort in subsurface sciences will be expanded from $7.3 million to

$11.8 million in FY 1990 to develop a better research base for cost-effective management and remediation of contamination from the Department's energy- and weapons-related project wastes. The recent discovery by BER-supported researchers of microbial communities over 1700 feet deep within the earth has changed scientific thinking about microbial abundance and diversity at such depths. Previously, such diversity and abundance was believed to be common only at depths of tens of feet. This discovery may contribute to cost effective in situ cleanup of deep groundwater contamination. Technology transfer of the newly discovered microorganisms to the pharmaceutical industry is already underway. Work supported in FY 1990 will focus on understanding of the factors that influence the mobility of mixed wastes through the soil so that shallow, low-level waste burial sites can be operated more safely and cost effectively.

Another major area of emphasis in FY 1990 relates to carbon dioxide and the greenhouse effect which, linked to global climate change, has become a national and international science and energy policy issue. A major component of the global change activity is the Carbon Dioxide program, which I previously mentioned. It is continuing to develop sound, quantitative information about atmospheric CO_2 and other energy emissions and their effect on climate and earth resources. We must improve our understanding of the cause and effect relationships between CO_2 concentrations and global, regional, and seasonal warming to support energy policy recommendations. This program is focused on the scientific aspects of the problem.

The FY 1990 budget request will support research aimed at improving our knowledge base in the above areas, with particular emphasis on the key issue of determining the quantitative links between the rise in concentrations of greenhouse gases in the atmosphere and global warming. Specifically, we must have a better understanding of how climate is changing and whether those changes are related to atmospheric greenhouse gases. Substantial improvement is needed in the way oceans and clouds are portrayed in climate models in order to accurately predict changes. Finally, we need to collect data to evaluate the primary effects of both CO_2 and climate change on biological systems as a whole.

The program will seek multidisciplinary input from the scientific community to gain a broad perspective. Climate change research activities throughout the Department are being coordinated by Energy Research, with interagency coordination being implemented through the Committee on Earth Sciences of the Federal Coordinating Council for Science, Engineering, and Technology. International activities are being coordinated through such organizations as the Intergovernmental Panel on Climate Change.

The FY 1990 request for Program Direction is \$4.6 million. These funds are required to pay for the personnel costs of 55 full-time equivalents to direct, manage, and support BER's multidisciplinary research efforts.

The FY 1990 BER budget request for Capital Equipment and Construction is \$16.0 million. This includes \$12.5 million for Capital Equipment and \$3.5 million for Construction. The Capital Equipment request supports replacement of deteriorated and obsolete equipment at the laboratories as well as acquisition of new, state-of-the-art equipment, particularly for the carbon dioxide and subsurface sciences activities. The General Plant Projects that fall under the Construction request are necessary to keep the general plant of the laboratories (e.g., buildings, roads and utilities) in good operating condition.

Now let me turn to the several ER programs that are related to my statutory responsibilities to advise the Secretary on DOE's research and development programs, on the non-weapons multiprogram laboratories, and on the education and training of scientists and engineers.

ENERGY RESEARCH ANALYSES

The technical assessments and research analyses carried out under the Energy Research Analyses (ERA) program cover all aspects of the Department's civilian

R&D programs. These in-depth reviews provide information on the quality of the research and its impact, as well as on opportunities for future research. In addition, the program plays a key role in coordinating the Department's involvement in acid rain research. Specifically, the program provides funds under the National Acid Precipitation Assessment Program (NAPAP) for summarizing the state-of-the-science in acid rain research and producing assessment reports useful for policymakers.

The FY 1990 budget request of $4.0 million will provide funding for peer reviews of projects in the Office of Energy Research and also in Conservation and Renewable Energy, and Fossil Energy. It will also provide for technical assessments which will be performed in areas such as advanced polymer composites, corrosion, and plastics recycling. In addition, funds will be provided to help complete the final NAPAP Assessment, including support for synthesizing the results of over $500 million worth of Federally funded acid rain research through FY 1990.

UNIVERSITY RESEARCH SUPPORT

The Nation's colleges and universities produce much of the new scientific knowledge and technical talent that ultimately contributes to the Nation's economic and social progress. For this reason, the Department supports close interactions with the Nation's universities through direct support for on-campus research, collaborative efforts involving DOE laboratory scientists and facilities, and the specific research and science education-related programs that I will discuss next, the University Research Support program and the University Research Instrumentation program. These programs help strengthen university capabilities to perform long-range R&D, contribute to the quality and numbers of young people pursuing energy R&D careers, and enhance technology transfer to the private sector.

The FY 1990 budget request for the University Research Support (URS) program is $16.1 million. The four URS activities include Laboratory Cooperative

Science Centers, R&D Laboratory Technology Transfer, University Reactor Fuel Assistance, and Energy Manpower Development (Table 13).

Table 13
Energy Supply R&D
University Research Support
Budget Authority
($ in millions)

	FY 1988	FY 1989	FY 1990 Request
Operating Expenses			
Laboratory Cooperative Science Centers	$ 13.6	$ 15.4	$ 9.4
R&D Laboratory Technology Transfer	1.1	1.4	1.7
University Reactor Fuel Assistance	1.7	2.2	2.3
Energy Manpower Development	1.8	2.7	2.7
Total University Research Support	$ 18.2	$ 21.7	$ 16.1

The first URS subprogram, Laboratory Cooperative Science Centers, includes support for faculty and student research and training appointments at the DOE laboratories. The essential roles played by the Department's laboratories in assisting in university research and manpower development have been strongly endorsed in reports of the Energy Research Advisory Board (ERAB) and White House Science Council on the health of U.S. colleges, universities and industry. The recent ERAB report to the Secretary on the Department's role in science education (August 1988) states that "perhaps the Department's greatest contribution to education is in providing a link between universities and the laboratories." Consistent with these analyses, the URS program continues to provide expanded support for lab-based education activities. A major initiative begun in FY 1988 provides support for semester-length appointments for undergraduate science and engineering students selected nationally based on academic merit and future research interests. These appointments will be provided to approximately 450 students and to about 36 faculty/student research teams at six laboratory science centers. Support will also be provided for some 2,000 summer faculty/student research appointments.

It is broadly accepted that person-to-person interactions are the keys to successful technology transfer. The R&D Laboratory Technology Transfer subprogram aims to make the results of Federally funded R&D more widely available in the marketplace by cost-sharing the assignment of industry scientists at multiprogram and major single-purpose laboratories and by supporting pilot technology transfer initiatives. In FY 1990, 30 industry-laboratory technology exchange assignments involving personnel from both large and small companies will be funded.

University Reactor Fuel Assistance provides support associated with the fabrication and shipping of nuclear fuel for university-based nuclear research and training reactors. The FY 1990 budget request will provide for refueling five reactors and will fund 20 reactor sharing research awards involving scientists from more than 50 universities. Continued support also will be provided to the low enriched uranium (LEU) reactor fuel conversion program required by the Nuclear Regulatory Commission. By FY 1990, 11 nuclear reactors will have either converted, or will be in the process of converting, to LEU.

DOE, along with other science agencies, depends on a continual flow of new, highly educated scientists and engineers for its current and future programs. The last URS subprogram, Energy Manpower Development, carries out a number of activities directed at increasing the number of young people pursuing energy-related scientific and technical careers. For example, the FY 1990 budget request will support approximately 23 Pre-Freshman Engineering projects reaching 2,200 students, as well as seven high school science student honors programs. The latter will be conducted at the Lawrence Livermore, Brookhaven, Argonne, Lawrence Berkeley, and Oak Ridge National Laboratories, Fermi National Accelerator Laboratory, and the Pacific Northwest Laboratory. At least eight DOE laboratories, including the seven I just mentioned and Los Alamos National Laboratory, will also sponsor summer research programs for approximately 150 high school science teachers selected on a national basis.

UNIVERSITY RESEARCH INSTRUMENTATION

University scientists conducting research for DOE need access to state-of-the-art research instrumentation. The Department's University Research Instrumentation (URI) program helps universities acquire the state-of-the-art instrumentation that is needed to conduct long-range research on energy problems. In the process, the program provides graduate students with hands-on experience in the use of this sophisticated research instrumentation. This annual, competitive program involves substantial cost-sharing from the institution receiving the equipment. Each year the Department's program managers help select the high priority energy topic areas that are to be emphasized in the URI program announcement. The annual awards are based on merit, the accomplishments of current DOE-supported research projects, and the degree to which the new equipment will enable researchers to substantially advance the understanding of energy-related phenomena.

The FY 1990 budget request of $5.0 million for the URI program will assist universities in purchasing instruments that cost over $100,000 each and that will be used by a number of researchers, including students. In selecting approximately 20 proposals to be funded, special emphasis will continue to be given to the need for innovative instrumentation needed to carry out research on advanced topics in energy research.

MULTIPROGRAM ENERGY LABORATORIES-FACILITIES SUPPORT

The goal of the Multiprogram Energy Laboratories-Facilities Support (MEL-FS) program is to reduce facility deficiencies and maintain safe, cost-effective, environmentally clean and productive operations at the five national laboratories overseen by the Office of Energy Research. To accomplish this, the MEL-FS program supports activities that counter problems of aging and obsolescence of facilities and of environmental compliance.

The MEL-FS program consists of two subprograms. The General Purpose Facilities Construction subprogram originated in FY 1981 as a broad program for rehabilitation, upgrade, or replacement of deficient buildings, utilities, roads, railroads and other related facilities at the laboratories. The Environmental Compliance subprogram originated in FY 1985 to address environmental deficiencies at Oak Ridge National Laboratory.

The FY 1990 budget request for MEL-FS is $53.0 million (Table 14). Of this amount, $32.5 million is for the General Purpose Facilities Construction subprogram. This request will provide for 26 construction projects, of which many are environmental, safety and health related improvements.

Table 14
Energy Supply R&D
Multiprogram Energy Laboratories - Facilities Support
Budget Authority
($ in millions)

	FY 1988	FY 1989	FY 1990 Request
General Purpose Facilities			
Construction	$ 28.5	$ 31.2	$ 32.5
Environmental Compliance-ORNL			
Operating Expenses	12.9	8.8	9.0
Capital Equipment	.4	.3	0
Construction	11.8	15.4	11.5
Total Environmental Compliance	$ 25.1	$ 24.5	$ 20.5
Total Multiprogram Energy Laboratories-Facilities Support	$ 53.6	$ 55.7	$ 53.0

The FY 1990 request for the Oak Ridge National Laboratory Environmental Compliance subprogram is $20.5 million. Of the total request, $9.0 million is for Operating Expenses and $11.5 million is for Construction. The request for Operating Expenses is necessary to continue to characterize and investigate current waste handling and environmental control systems, leading to upgrades of these systems, and to continue remedial investigations and feasibility studies on previously contaminated sites. The Construction request will provide for continuation of a high priority project to upgrade a portion of the liquid low-level waste collection and transfer system at ORNL and initiation of a few minor general plant projects designed to correct deficiencies in operating systems. This subprogram is focused on bringing operational systems up to current environmental standards.

ADVISORY AND OVERSIGHT PROGRAM DIRECTION AND POLICY AND MANAGEMENT

The FY 1990 budget request for Advisory and Oversight Program Direction is $3.4 million. The FY 1990 request will provide the staffing resources required by the Director of Energy Research to carry out his responsibilities under legislation (P.L. 95-91) and those assigned or delegated by the Secretary in areas beyond the scope of other ongoing Energy Research programs. These funds are required to provide for the salaries, benefits, travel and other expenses associated with 44 full-time equivalent employees.

The FY 1990 request for Policy and Management is $0.7 million. These funds are required to provide for the salaries and related expenses associated with 8 full-time equivalent employees in the Office of the Director of Energy Research.

That concludes my statement. I would be happy to answer questions.

ELEMENTS COMMON TO THE RESEARCH ACTIVITIES

Dr. **Hunter**. I am here today to discuss several areas that are included in the "General sciences" and "Energy supply" accounts. These areas include high energy physics, nuclear physics, basic energy sciences, magnetic fusion, biological and environmental research, and educational programs and university support.

Before we go into the details of the different topical areas, I would like to point out some elements common to the conduct of research in these areas.

First, the great bulk of the work is basic research. In basic research, competition among the different researchers leads to utilizing the best means in a given area to obtain the information needed.

Second, the urgency for basic research is not easy to quantify and establish. Since the consequences of the information are not explicitly known, we rely on the observation that to produce the best scientists and scientific results, you must work in a fashion that forces the pace of advances in an area.

Third, it follows that the scientific communities, through a variety of mechanisms for conducting scientific competition, such as advisory and review committees, are the basic means for determining the direction and form of research that is to be pursued.

In accordance with these points, and to enable these communities to pursue research and assure the highest quality basic research, the Department of Energy relies on the best scientific talent to generate its research programs. This year, for example, the Nobel Prize in physics was granted to Leon Lederman, Melvin Schwartz, and Jack Steinberger for research on facilities built and supported by this program. Dr. Lederman has managed Fermilab, one of our——

Senator **Johnston**. Not to interrupt, but you are singing to the choir as it relates to basic research. I know the good work that you do, feel it is very important, and don't think we have enough money for it. So, I'm convinced on basic research.

So, if you would move on to the next point, please.

Dr. **Hunter**. Well, the next points here are that to maintain it, you have to continue to invest in new facilities and people and tools, even at the times when you are under budgetary stress.

Senator **Johnston**. I agree.

Let me focus on some specific matters, and then if I have left anything out—because there are a number of areas I want to cover—then you can address those.

First, magnetic fusion.

MAGNETIC FUSION ENERGY

We read in the Wall Street Journal that the Department wants to accelerate the funding of CIT as the step prior to going into an international consortium to build a prototype.

Now all of the information to date has indicated that commercialization of magnetic fusion energy, if ever, would not be available until the 2030-2040 timeframe? In other words, has there been some breakthrough lately that would make electric generation from magnetic fusion feasible in a different timeframe than that which I have just described?

Dr. **Hunter**. No, sir; in the immediate past there has been very steady and quite good scientific progress. There have been no, as of the moment, breakthroughs, in our opinion, that would warrant very substantially accelerating the program.

But I believe the report to which you refer was the result of a study commissioned 2 years ago by the Office of Energy Research and performed by the National Research Council in which they advocated the same program structure as we have today, that is, the Compact Ignition Tokamak, as the next major step, which is in this budget; second, substantial and continued participation in ITER, the International Tokamak Experimental Reactor. I think that the only major issues are a question of what they felt the pace warranted.

PACE OF RESEARCH ACTIVITIES

What we have done, because of concerns I had when I first came in that this program was subcritical, if you will, was we have examined very carefully in the last several months what we view to be the basis for proceeding on CIT to ensure that we can get to ignition when we build it. I do not view this as a short-term problem with any immediate breakthroughs, but simply the culmination of a very long development line in which we want to assure that, when we build CIT and it comes on line, that you get true ignition; you get a lot more energy out than you put in to heat the plasma.

We have looked at that. We submitted a reprogramming here and to the other committees which we are going forward with in the area of confinement physics so that we can make sure we understand on the present machines the energy transport, because that has been the key to exactly how well these machines work, and as they go to larger size, has a big leverage on the amount you have to invest to assure that you attain ignition.

So, I would characterize the area as one in which we have seen a constant march forward. I think that the basic program structure was the same in that study as we have discussed with you.

Senator **Johnston**. Was the Wall Street Journal report saying that you want to go forward with CIT on an accelerated schedule correct?

Dr. **Hunter**. I did not read the Wall Street Journal report you refer to, sir. I have read a synopsis and discussed with the——

Senator **Johnston**. Do you want to put CIT under contract in this fiscal year?

Dr. **Hunter**. Under an accelerated contract?

Senator **Johnston**. Yes.

Dr. **Hunter**. No, sir; not under any accelerated pace.

Senator **Johnston**. How do you justify spending $360 million for a program that is so far in the future, 2030, 2050, whatever it is, keeping in mind that it competes with all the other scientific programs?

Dr. **Hunter**. Well, I believe the number for magnetic fusion is $349 million for 1990.

Basically, I feel that a major development line has been and remains to provide a very economically and environmentally attractive energy option for the future. What I have seen in the Department is that we are increasingly driven by environmental considerations and given that you have invested since the early 1970's some $6 billion in then spent dollars in this program in this country and roughly four times that amount worldwide—and we have gotten extremely good scientific advance and extremely good performance advance in the machines. I think we are at a stage where, when we go to build CIT, we can build it with a high degree of confidence that it will ignite. You will be in a situation in roughly 10 years from now where you will have a machine sitting in a laboratory that will put out a lot more energy than you put into it. That is what we are trying to assure.

If you have that, I believe the commercialization pace then depends on several factors which we don't necessarily control. But I think that is a very substantial contribution to the energy future of the country.

COMPACT IGNITION TOKAMAK

Senator **JOHNSTON**. First, do you think we ought to have a new construction start for CIT this year?

Dr. **HUNTER**. You have a new construction start proposed in front of you. We are taking under review right now, as the Secretary of Energy has stated and I have stated in previous testimony, the assuredness of attaining ignition when we go to build this machine.

Senator **JOHNSTON**. You mean when you go to construction start.

Dr. **HUNTER**. Yes, sir; that is what we have been reviewing. We will come forward with a final word on that soon. We don't have it quite yet. We have had a panel review it, and I have been closely involved in it.

Senator **JOHNSTON**. So, your new construction start request is a tentative one at this point.

Dr. **HUNTER**. No, sir; the proposal before you was for the construction start. What we have gone through is we want to be assured that the construction start we offer you offers a very high degree of confidence in the outcome at ignition. We are conducting that review right now, and if it appears to us at the conclusion of it—and I hope that is in the very near future—that the probability, for example, is fairly low for ignition in that machine, then we will inform you and act accordingly. But the construction start in front of you now, in the present budget, is to begin construction on CIT this year, but it is under review.

Senator **JOHNSTON**. When will you have the results of that review?

Dr. **HUNTER**. We have had the results of the subpanel set up for that purpose for roughly 1 month from the technical groups that reviewed it. We are conducting a review inside the administration that I hope will be concluded in the next few weeks.

Senator **JOHNSTON**. All right. Thank you.

What degree of confidence do you have that we will be able to produce electricity at an economically viable cost sometime in the next century?

Dr. **Hunter**. I do not foresee the future accurately. There are many factors out of the control of my foresight and what I can envision today.

I would say the following to you. All the economic studies that we have and the environmental assessment as to the advantages of fusion may make it extremely attractive economically. If you combine the fact that it does not produce in the present variants a large volume of high-level wastes. It produces a substantial volume of medium- and low-level waste, but not of high-level waste, and so it would not be subject to the same constraints, in terms of nuclear waste disposal. Second, it does not——

NUCLEAR WASTE DISPOSAL

Senator **Johnston**. When you say constraints in nuclear waste, what are those constraints?

Dr. **Hunter**. Well today, for example, we go through licensing hearings and things of those sorts in the nuclear power industry. They have resulted, in many cases, in economic penalties associated with tying up the capital and things of that sort.

The Department of Energy has a very large program, as you know, to do high level waste storage in Nevada and to undertake that.

It seems to me that, if you can have nuclear power producing variants that will not produce high-level waste, it is to be preferred perhaps to those that do.

Senator **Johnston**. I think it is to be preferred, but it seems to me you were making an overstatement as to the difficulty and the expense of dealing with that high-level waste. There has been uncertainty, but that is largely manmade. It seems to me that you scientists tell us that high-level waste can be safely——

Dr. **Hunter**. Yes, sir.

Senator **Johnston** [continuing]. And we hope at least some day economically stored away if we quit wasting so much money in the program.

Dr. **Hunter**. Senator Johnston, let me assure you that I very strongly support reactors and the storage of high-level waste and think it can be accomplished safely. But that is why I couched at the beginning of this, that I cannot foresee the future. A lot of those constraints will be manmade and I think that in the case of fusion, where it hasn't worked yet—it has not proven its technical feasibility as an energy producer—you know, those kinds of future possible attractive attributes are certainly outweighed by its relative technological status today.

But you asked me what I could foresee as to why you would want this thing. OK? All I am trying to say to you is that from my viewpoint, we see this energy situation becoming increasingly environmentally dominated, that is, through man's constraints and considerations. As a result of that, the costs for a given facility are widely variable because they depend on these delays and things that people can impose on themselves.

So, in that sense, I think this is an extremely attractive option, if you can prove that it will work well technically. But until you have proven that, you certainly overstate the case if you offer it as a really strong energy alternative.

Senator JOHNSTON. Well, I have heard scientists say through the years that, first of all, they think it can be made to work, but many who say they don't think it could ever be made economical from a production standpoint—that it never would be able to compete even with today's light water reactors and probably not with tomorrow's improved or advanced kind of reactors, whatever they may be.

How would you characterize your degree of confidence? Possible, hopeful, probable? I know there have to be some adjectives that constitute nothing much more than Kentucky windage, but we have to make our judgments on those kinds of things.

COMPACT IGNITION TOKAMAK

Dr. HUNTER. Well, let me give you my judgment, and let me once more preface this. I view the energy issues 20 to 30 years from now as clothed in uncertainty because of issues like the greenhouse effect, et cetera.

But given that, what I see in the fusion area is the following. You have a machine, the tokamak, that, in its present variant, if you simply build it larger to make sure that it works, may require very large capital investments and a very long technological investment phase for development. That could take 50 years. You know, it could take 60 years. It could require in the end that powerplants be built at the 1,000 to 4,000 megawatt electric capacity. In other words, a situation that would require a lot of pull to be attractive.

On the other hand, I think that we are close, if we can understand the confinement issue in particular. We are very close toward being able to build machines that would be economically quite attractive.

Let me give you a numerical example. In the present machine at Princeton, TFTR, the transport is down roughly by a factor of 20 from the ideal value. If that machine had worked, if that transport had turned out to work at the ideal calculation given us, that machine would not only have gotten breakeven, it would have gone ahead and given us probably a high energy gain and in a configuration that I think would be very amenable to being a very attractive reactor-type situation.

So, it's to resolve that uncertainly, to know for sure what that is, that we propose to build the CIT and carry out as soon as we can, these experiments on energy confinement.

I hope out of that will also come invention that, as we understand it, we will be able to invent new variants of the machine and be able to drive the commercial attractiveness of the machine up. But I think, without that crucial experiment of doing ignition and at the same time understanding the physics that goes on it is, that these questions remain with a lot of windage, that you have an enormous window.

So, if you will, from my viewpoint, the real thing we are trying to get at here is to reduce those unknowns and cut our windage down. I don't like aiming at something when I have a one radiant field of view. Well, that's what it boils down to when you ask me that question.

SUPERCONDUCTING SUPER COLLIDER

MAGNET RESEARCH

Senator **JOHNSTON**. Well, we look forward to getting your results on that.

Let's turn to the superconducting super collider. It's a $250 million request. How much of that is for magnet research?

Dr. **HUNTER**. Magnet research for superconducting magnets in 1990 is $44 million.

Senator **JOHNSTON**. What are the problems with the magnet design? Do they work? Do you have a high degree of confidence they will work?

Dr. **HUNTER**. Four out of five of the last full-scale magnets built in the laboratories have worked. They have gone to full field. They have done it with none or one quench. The fifth magnet had an error where there was solder left on the end of one of the superconducting cables, and at where they were joined, it did not work well.

So, I have very high confidence that you can build a magnet today in the lab and get it to work by skilled craftsmen.

The issue that we are attacking here, and that we have to proceed on in the program, is we want to be able to produce these with a very high degree of reliability and a very low cost compared to what they are being produced at today.

Senator **JOHNSTON**. Do you think you can do that?

Dr. **HUNTER**. Yes, sir.

Senator **JOHNSTON**. A high degree of confidence.

Dr. **HUNTER**. Yes, sir.

NONFEDERAL PROJECT SUPPORT

Senator **JOHNSTON**. The State of Texas has pledged $1 billion. How much of that would be put up in fiscal year 1990?

Dr. **HUNTER**. We have not worked out the exact details yet with the State of Texas. Those discussions which we initiated are ongoing.

Senator **JOHNSTON**. Can you keep us advised on that because we are going to have a lot of difficulty with a lot of these projects, and we want to have as high a degree of confidence in each of the problem areas, magnets, money to be put up by the State of Texas, et cetera? The more confidence they can give that we can count on their billion dollars, the better off we are. The more of that is put up early, the better off we are.

Dr. **HUNTER**. Yes, sir; we will keep you closely apprised. We are preparing an international plan and hope to have that worked out soon and made available. And in the course of that, we will also go forward and push to make sure that the contributions are understood from the other parties as well.

INTERNATIONAL PARTICIPATION

Senator **JOHNSTON**. By the way, on the international plan, I don't share the enthusiasm that some have for international participation, because my fear is that we get outbargained by our international partners in everything we do. I'm afraid that in order to get a few bucks from the Japanese or whoever, we will end up giving away so much of the making of the parts and the technology, that it would be better to do it ourselves. Unless you can get something really good in terms of international cooperation, that is not going to have much effect on me. I don't know about my colleagues.

Dr. HUNTER. Well, we have structured the plan—and again, I don't have the details in front of me—to try accommodate those concerns and to assure that American industry ends up with the capability to build the superconducting magnets, deliver a large fraction of them, and also that our technology is not transferred overseas. That is, most of the contributions, as in these physics programs in the past will be in kind. We will give them performance specifications and they will deliver hardware to those specifications.

Senator JOHNSTON. My own view is that unless they will do something good—in other words, put up some serious money—I would just as soon keep them out of the project. But that is for whatever good it is to your decisionmaking process.

HUMAN GENOME PROJECT

Now, on the human genome project, what is the total estimated cost of that program?

Dr. HUNTER. The project for this year, sir, or for the lifetime of it?

Senator JOHNSTON. Total.

Dr. HUNTER. There is not a very long-term plan worked out for the human genome project. Essentially, we have seen, between ourselves and the NIH, very substantial advances in the funding, and what we have is general, rough technological goals for the cost of sequencing a base pair, for example. But we do not have a total project cost for you.

Senator JOHNSTON. Do you have any orders of magnitude, just your own guess?

Senator DOMENICI. Are you talking about sequencing or mapping, Mr. Chairman, or both?

Dr. HUNTER. Sequencing is the ultimate advertised goal of the program. Mapping is certainly something we are doing now, and we will be doing in the near future.

But in terms of driving the sequencing cost down to where we can look at the entire genome, my sense of this—and this is simply a sense, sir, it is not a carefully worked out set of thoughts—is that, if the program is pushed on a strong, technological basis in a 5- to 10-year timeframe at roughly the current level or somewhat higher, you will end up with the capability to sequence 10 to the ninth pairs or more at costs that are acceptable, and that means at the tens of millions of dollars level, if you wish.

One thing that has happened this year is we got for the first time a direct image taken with a scanning tunneling microscope of DNA. It was an extremely exciting event. What it points to is that, opposed to purely the biological and chemical means of trying to unfold how these complicated molecules fit together and what their coding is, that we may be able to directly employ physical means—that is, looking at them directly and being able to manipulate them—which could lead us to an enormous advantage in terms of the cost over what we see now.

Senator JOHNSTON. Mapping would be much more complicated and more difficult as an ongoing project, would it not?

Dr. HUNTER. No, sir; the object here is to simplify things. It is simply that, to give you an example, in 1952 I believe, Crick and Watson deduced what the structure of DNA was from some x ray and bond type of calculations. This is the first time we have actually seen it. It is direct imagery, if you will, not taken with light, but direct imagery.

We have started an initiative to do what we call microimaging, using our advanced x-ray rings and things of that sort. The hope is that we will end up able to look directly, if you will, at the level of structure instead of relying on very complicated and indirect means.

I don't mean to tell you that this is the exclusive way it should go, but we have seen an enormous unfolding of the possibilities in the last year.

Senator JOHNSTON. Well, I think there is a lot of enthusiasm with me and on this committee other than Senator Domenici who doesn't like the project very much. [Laughter.]

Senator JOHNSTON. But the rest of us rather like it. I hope we can follow that through, because from what I know about it, which is not enough—I would like to know more. But it really has great promise for long-term health care and genetics, those things.

Senator DOMENICI. I don't want those people over there to think that you were speaking the truth.

Senator JOHNSTON. They know better than that. [Laughter.]

No; Senator Domenici is not only enthusiastic, he is a nut on the subject. [Laughter.]

And a bore besides. He just talks nothing but human genome. [Laughter.]

Senator DOMENICI. No; I talk about three or four others, but I'm boring on all of them. [Laughter.]

Senator JOHNSTON. All of that is all in good fun.

GLOBAL WARMING

On global warming, is there any remaining scientific disagreement or debate as to whether the greenhouse effect is real?

Dr. HUNTER. In my opinion there is a very large range of uncertainty associated with the greenhouse effect. It is very real in the sense that it is starting to have very real and immediate impact on our policies. But the way I would characterize it is the following, it could be a terrible problem, or it could be no problem in my opinion. The bounds are that great.

Senator JOHNSTON. Or it could be a reverse effect from warming to cooling.

Dr. HUNTER. Yes, sir; it is involved with trying to predict the climate. I have looked at the data.

What we have done this year is to try to ask ourselves—what we are starting to ask ourselves seriously is, what do we have to do?

Senator **Johnston**. If I may interrupt your testimony. Senator Domenici wanted to make a statement because he has to leave at 2:30. If he leaves at 2:30, it will be the shortest he has ever made in this committee. [Laughter.]

So, we are curious to see if he can really do it. So, excuse us for interrupting.

Senator Domenici.

STATEMENT OF HON. PETE V. DOMENICI, U.S. SENATOR FROM NEW MEXICO

Senator **Domenici**. First, let me welcome the national laboratory directors who are here today, and thank them and their colleagues for the scientific excellence our national laboratories bring to the United States. I would like to commend the distinguished chairman from Louisiana, for his genuine interest in the strength of science and technology within these institutions—the nine national laboratories, including the three that are nuclear deterrent labs. Mr. Secretary, I want to submit to you that his support is a credit to his genuine concern about this country. I laud him for it. He knows more about these programs than many who have laboratories in their States.

The chairman is not one who is running around talking about closing them down. Rather, what we are doing here today, Mr. Secretary, is trying to find out how we can better use the fantastic talent that is accumulated in our national labs. I believe I've used my 5 minutes, Mr. Chairman.

Senator **Johnston**. Don't feel constrained in time. You are doing very well. [Laughter.]

Senator **Domenici**. Having said that, I want to say to the experts and directors who are here that I have the job of managing a budget resolution on the floor this afternoon. I hope that when we are finished with the budget and appropriations bills, they do not hurt the national laboratories.

Dr. Hunter, I want to quickly talk about three things.

First, I am absolutely thrilled that your new boss is the kind of person that he is. I think for the first time in my 17 years in Congress, other than a short period of time when Dr. Schlesinger was around, we have a Secretary of Energy who is trying very hard to understand the tremendous potential of these national laboratories. I believe he is going to try to use them as part of solutions to both short- and long-term problems facing the United States. He is going to have a lot support from this Senator, and I believe the entire Congress.

TECHNOLOGY TRANSFER

The three issues that concern me include: first, this general idea of technology transfer. I believe it is incumbent upon the Department of Energy to do everything within its power to promote technology transfer without our having to legislate it, even though we will. The chairman has helped us with a technology transfer modernization bill, which essentially affects our three nuclear defense laboratories. These labs have been very much inhibited in such activities in the past.

I believe a Secretary who will use these laboratories with universities and the private sector to increase the long-term productivity of this country will go down in history. If we don't use the resources and talent of our labs, they will start to atrophy. It will be extremely difficult to rebuild these resources if we let them go now.

I urge that you do everything in your power without legislation to make it easier for those who need the knowledge in those labs to feel comfortable using them, and to know that if they gain some knowledge on a product, either enhancing one or inventing one, that they are not going to lose out in the end. The current application of proprietary interest in the United States is an enormous problem for American industry as it seeks to be competitive.

The witnesses today know it is not easy. At every level of technology transfer there is a stumbling block of some type. If you don't have a Secretary saying stumbling blocks are there to get rid of, what you have are stumbling blocks that turn into roadblocks and nothing gets accomplished.

My second point is that people are still saying that the Japanese are doing better than the United States on many fronts. Let's pick any one you want. High temperature superconductivity research centers are a good example. I tell you it was absolutely disheartening to find the United States of America announcing it was really going to get involved in this field, and then DOE didn't mention a single national laboratory until a number of us put them in a room and asked them what in the world they were doing. We reluctantly got some verbiage out of DOE that we will have three centers at our labs.

Now, Dr. Hunter, it doesn't do any good to create three centers—Argonne, Los Alamos, and Oak Ridge—unless the Department analyzes what they need to make them work and helps them. They will tell you right now that there is enormous industrial support for that kind of work, but they need help. They need it to be a mission of DOE, because they can't scrape up crumbs to get it done.

My third point is that DOE is a first-class scientific operation, and it ought not treat itself like a second-rate citizen in any field, including the National Institutes of Health when it comes to DOE and NIH on human genome research. If we look at the numbers, DOE got a $10 million, or 53 percent, increase in the President's budget request. NIH got a $72 million, or 260 percent, increase. I believe that is nothing more than that NIH won a turf battle. I believe DOE must undertake the engineering and up-front work that has to be done. The human genome project cannot go forward without some of the technology the labs are going to develop.

Clearly, human genome research and high temperature superconductivity are cutting edge technologies that have fantastic potential for humankind.

I want to urge DOE to do everything it can to help the new Secretary make these labs all that they can be. They don't have to be single-purpose laboratories. The people are too good, and the capacity is too great. The labs can do many other things, including helping America's private sector either enhance products or invent new products. I think your testimony clearly indicates that it is your desire that the labs be just that. I hope you will ask us as a committee many times how to help you do it. That is what we need.

I will close. Again, I can't say enough about this committee and this chairman trying to use the full capabilities of these laboratories. I compliment him for it, and thank him for having this hearing. I probably would ditch anything else around here for the rest of the afternoon because I get so excited about the talent and expertise at the national labs. I think that if I am not on the floor, they will assume that the one last proponent of the budget resolution has disappeared into the woodwork, and they won't know I'm here. They will say I copped out on them. So, I guess I better go and just thank you, Mr. Chairman.

Senator JOHNSTON. Thank you, Senator Domenici, and thank you for your kind comments. With all our good fun on the committee between Senator Domenici and I, we really do share an abiding confidence in our national labs and a feeling that we should use those beyond the present defense configuration of the country.

If Mr. Gorbachev is for real, then we are going to have a dramatic reconfiguration of defense, certainly fewer nuclear weapons. He may not be for real. Dick Cheney may be right. He may be followed by a Khrushchev or worse. I don't think so. But if that is so, then we need to find a new mission or new missions for the national labs in science. Frankly, some kind of model like SEMATEC using the national labs or HDTV or whatever—I'm not smart enough to be able to say exactly how they ought to be used, but I think to use a bad word "industrial policy" using the national labs—maybe a part industrial policy, or maybe there is a new word we ought to use.

I think they could be extremely useful because the national labs produce things that work and must work. They are very basic in their science, but very developed in producing things and in managing the production of things. I think that could be a very valuable thing for the country as we go into international competition where the competition is MITI who can combine different businesses and banking and Government policy all in one.

So, I very much agree with you on that.

Senator DOMENICI. Mr. Chairman, you might be interested—and if you know this forgive me for being repetitious—that, for instance, the new Secretary is very close to arriving at the conclusion that our national laboratories have a real mission in doing the research and design and conceptualizing of the nuclear cleanup that we have seen could cost from $80 billion to $300 billion. Nobody even knows what kind of engineering, what kind of design, what kind of technology we are going to use to do that work.

What better place to go than to the national laboratories and take the first couple of years to develop a plan rather than creating $200 million worth of new consultants across the country? That is what we will be doing if we don't use the national laboratories. The Secretary thinks they ought to put their great talent into figuring out the best way to do that cleanup, and I wholeheartedly agree with him.

I am hopeful that when he presents that, someone like yourself will say that is precisely the kind of thing for which we ought to use these great resources and bastions of talent and equipment. I think the labs will solve it far better, and in a more environmentally sound and more reasonably priced fashion than anybody thinks possible if you give the labs some time to work on it.

Thank you very much.

Senator JOHNSTON. Thank you, Senator Domenici.

GLOBAL WARMING

We were talking about global warming. We have a lot of jurisdiction for that in my authorizing committee, Energy and Natural Resources. We want to respond appropriately and not hysterically. What should we do on global warming?

First of all, you might finish your thought about what you think we know and don't know.

Dr. HUNTER. Well, actually what I was referring to at the instant moment there was I think the way we have to look at the problem, we have to make this into a quantitative scientific problem. We have to ask ourselves how can we provide you, the decisionmakers, and the administration, with the information you need to actually decide on the difficult tradeoffs you must make in the energy area.

So, what we are looking for and have focused on this year is this question of quantitative linkages. If you put gas into the atmosphere, does it warm the atmosphere, does it cool it, et cetera? What do you have to do to actually solve that problem and get a good concrete answer to it?

Senator JOHNSTON. Let's follow step by step what we know. We know the gas is increasing in the atmosphere.

Dr. HUNTER. Yes, sir; the CO_2 concentration is increasing.

Senator JOHNSTON. The NO_x and CFC's, et cetera. All of that is increasing.

Dr. HUNTER. Yes, sir; I'm not sure that—there are different numbers for the relative contributions of these other species.

Senator JOHNSTON. Is the temperature increasing?

Dr. HUNTER. Well, the sets of data that we have seen, there are different interpretations, depending on who has taken the data.

One set of data says that globally there has been a net increase over the last 100 years roughly.

However, there are arguments among the experts as to whether or not the thermal corrections for heat islands—that is, the monitoring stations are in or near concentrations of human habitation, so they may be biased by the buildup of the habitation.

There is a set of data taken in the United States for rural stations that shows very little increase over the last 100 years.

Then there are questions, even in the data that shows the increase, as to the correlation of the increase over different periods of time in different phenomena. As you know, the climate itself is a very noisy background.

Senator JOHNSTON. What is convincing to you about temperature increase?

Dr. HUNTER. To me, sir? I just honestly feel right now this could be the worst problem you have or no problem at all.

Senator JOHNSTON. You have no opinion as to whether it is rising or not?

Dr. HUNTER. Not due to the greenhouse gas releases. The problem is these signatures are buried in a very noisy, spatially distributed, and very climate noisy background. So, I don't have a firm opinion.

In fact, the position I have taken on it, I think we have to approach it from, is what do we have to do to really quantify it. So, I can give you an answer to that that is a scientific opinion that a lot of people could agree with and you could then prove in a scientific fashion. You could correlate the increases.

Senator JOHNSTON. Now, do we have in place an adequate assessment program to arrive at the truth of that judgment?

Dr. HUNTER. No, sir; not in my opinion. What we have been told by the people that even take the data is if the temperature data taken today are taken by people that take meteorological data for weather purposes. That is what it was set up for historically. It is short-term data.

The instruments change every 5 or 10 years. You don't know over the course of the 100 years, say, how to trace the evolution of the instruments.

So, you need ask yourself the question what do I have to monitor, at what density of points, for how long, and what do I have to be able to correlate with what sort of computational or purely experimental observations to be scientifically convinced of this linkage. That question in my opinion has not yet been thought through. We are beginning to think through it. The administration has taken an aggressive position with the committee on Earth sciences that is trying to look at the overall administration program.

You are living today on data that was taken for a different purpose; in essence, the networks were not designed for this problem. I think it is very important that we look at it with regard to the long-term view and getting you the definitive information as soon as we reasonably can. That is the position that I think the Department should adopt. It's a position in which there is flux. The situation has changed some.

The other thing is that in the interim, I think we should do various energy kinds of activities that are justified on other grounds. I do not think that you should adopt purely the greenhouse effect as a driving function for whether you choose one energy option over another today, in light of those uncertainties.

But if you do see work that you can undertake that leads to cleaner systems—one thing that we are thinking about now and starting to look at is can you scrub the CO_2 or can you scrub the carbon out of the exhaust. Are there ways to do that?

So, I think that you look at all those kinds of options. You don't simply ignore it. It may turn out to be an extremely serious problem.

Senator JOHNSTON. You might be thinking about how we can design hearings or at least a hearing to have a further debate on this because we have heard testimony from distinguished scientists who say that in the midst of the hot summer as we experience 100 plus degree temperatures, that the chances of that hot summer being caused by the greenhouse effect were about 99 in 100. In other words, there is no doubt about the greenhouse effect. There is no doubt that it is causing the climate to heat up. There is doubt about exactly how it will manifest itself in terms of climatic changes and what geographic areas and from year to year and month to month, but he and others have said there is no doubt about it.

I would like to be able to get a proper debate.

Dr. HUNTER. Well, you can have a debate, and I would be happy to see it structured however you desire. But I would leave this thought with you. I think the most important thing is to approach it with a completely open mind with a view toward, in the long-term, providing an educated, broad scientific community—that is, not just somebody that has a code somewhere. He could say that and he could be right. But you have to have a very large number of people that understand this problem and share a common understanding. Only in that way, if there is a very serious problem will you be able to enact the kind of very large scale changes that would be associated with ameliorating it.

Senator JOHNSTON. The kind of hearings I have in mind are designed to get at the truth of it by letting those who make those statements that it is for sure be challenged by the other fellows who can point out the variations between a thermometer which is close to the city and one that is out in the country and one whose computer readout plan is not adequate or sufficient or using the same instruments or for whatever reason, and let them have a scientific exchange.

HIGH ENERGY PHYSICS

Now, if I may move to high energy physics where $616 million is requested for 1990. Will this sum allow for full operation of Fermilab and the Stanford machines?

Dr. HUNTER. Yes, sir; I don't know the last few details but, yes, it will. Both machines are running quite well right now. They are very good in continuous operation at Fermilab at record energies and luminosities.

At the Stanford linear collider, Dr. Richter—the Director is here—I'm sure will tell you that they have just gotten both the linear collider to work, which was brand new and a first in American accelerator technology. In addition, he has in the last few weeks begun to produce substantial amounts of the particles he was searching for. We are committed to seeing those operations continue and be fully exploited.

Senator JOHNSTON. What didn't I cover that you wanted to cover, Dr. Hunter?

ADDITIONAL ITEMS OF INTEREST

Dr. HUNTER. I think that the thrust of my comments—the specifics here that I would make to you are the following.

We see a large number of machines coming here in front of you. The size of those machines is not picked because they are big. They are picked because in that area of physics, you need that machine to really make any progress. That is how they're done.

Second, those machines serve very broad communities. With modern transportation and modern communications, people all over the country, hundreds of universities and industrial groups, today use our machines at these user facilities. It has been a concept, if you will, of the national lab type arrangement that was brought into fruition right after World War II that allowed this very widespread and vigorous growth among the university and widespread American scientific community and still be able to do the forefront science.

So, basically that was the thought I wanted to communicate to you, and also that I think that we are seeing directly today and vividly—and I will pick one example, a real spinoff from like the accelerator technology. The production last fall of very high density chips with the x-ray lithography machine at Brookhaven by IBM has enhanced or heightened a race, and there are now a lot of machines around the world that are being built with a view toward industrial production. Those machines are really given a boost in their basic understanding in the early 1970's in this country when, for example, Dr. Richter did some of the first work on colliding beams.

So, we have seen evolution on roughly a 15- or 20-year time scale for the technology involved in these machines into other scientific endeavors, very widespread. Today in this Department, the high energy physics of yesterday is the condensed matter physics of today. These x-ray rings that have grown so enormously in popularity and now commercial utility have sprung from that technology.

COMPETITION FOR LIMITED BUDGETARY RESOURCES

Senator JOHNSTON. What do you think of the space station?

Dr. HUNTER. I don't have an opinion about the space station, sir. I have only been here since August, and I have been forming my own opinions about my own program.

Senator JOHNSTON. Well, I won't get into all the budgetary matters. I made a speech this morning on the budget, the thrust of which was to say that the apparent cut of $47 billion which achieved the Rose Garden victory that they claimed that great bipartisan support was imaginary—there was really no cut in the budget. The long-term budget deficit remains, and somebody at some time has to make choices.

It is unfortunate that science has to compete against other science. I hope it competes against other things. We don't spend enough on basic science in this country. We need to spend some more on things like the SEMATEC which is utilizing x-ray lithography, among other things—the new generation of super chips—to enhance our competitiveness. It might be a $100 billion business by the year 2000. SEMATEC and national research growing out of basic research can put us in the lead for that. So, I very much believe in that.

You are not the one to make those basic choices. For example, the space station is going to compete with some of these programs as is veterans and housing and drug research and taxes and all the rest. But that is too broad a subject for this particular hearing.

Dr. Hunter, I appreciate very much your testimony. I am impressed with your knowledge and grasp of it and your ability to relate and explain it to slow Senators up here. We appreciate it very much. Be assured that we will be calling on you for further advice.

Global warming is something, as I say, about which I have no fixed opinion and about which we must know a great deal more. If it is as bad as they say, it overwhelms all the other problems. In fact, if it as bad as they say, it is probably so bad there is nothing we can do about it anyway. It is probably like King Knut trying to hold back the sea. You just can't do it with modest little steps. But in any event, we need to know more about it, and we will be in touch with you about that and other matters.

I know as soon as you get that fusion study complete, you will send that to us.

Dr. HUNTER. Yes, sir.

NATIONAL LABORATORIES

I would just add and underscore Senator Domenici's remarks and yours with regard to the national laboratories. Just before this hearing this morning, we had a meeting of the laboratories, both the weapons and the nonweapons laboratories, where the Secretary directly interacted with them and addressed them on his intention to involve him closely in all the matters of major scientific importance facing the Department. So, we certainly do regard them as enormous assets and are trying to discharge our responsibilities to see the funds that you allocate to us are well spent.

COLD FUSION CONCEPT

Senator JOHNSTON. One final question just in 20 seconds or less. Fusion in a jar is sufficiently unproven so as not to merit any funding from this committee. Is that statement correct?

Dr. HUNTER. No, sir; I would not agree with that statement.

We have set up in the DOE a review committee to assess all the claims and to help us ascertain what should be done next. We had, in fact, prior to the break in the publicity and whatnot, elected to provide a grant to the University of Utah people, which they later then withdrew, after the publicity ensued.

We feel and have sponsored, for some 9 to 10 years at roughly $1 million a year average level, searches for alternative methods of fusion, including one called muon catalyzed fusion.

Senator JOHNSTON. Let me put the question another way. Do you see any reason why they shouldn't give at least part of their palladium rod that was used to other scientific laboratories for analysis?

Dr. HUNTER. No, sir; I have strongly encouraged. I spoke with Mr. Pons. We have made available—and I am sure Dr. Hecker of Los Alamos labs could inform you. We have offered to make available our instrumentation, our diagnostics, and any ability to repeat the experiment and things of that sort. We have asked the labs to keep going until we find out what is going on. The Secretary was very emphatic about that, but we have seen a lot of negative and no results.

I think it would be extremely useful to have an actual setup of the kind they say that worked so that someone else could duplicate the results or analyze them.

Senator JOHNSTON. Well, they have been unwilling, as I understand it, to furnish a piece of that palladium rod to distinguished laboratories for analysis.

Dr. HUNTER. That could be, sir. I don't know that directly.

But what I am saying is we have set up a review committee and our own laboratories have worked very hard trying to duplicate those results and analyze them. So far we have seen, to the best of my knowledge, no results that strongly corroborate this as a substantial possibility for energy production. We remain with our assessment we had prior to this event, that there is interest in solid state physics that one can see in these kinds of situations and that it should be investigated, but at a low level.

Senator JOHNSTON. Thank you very much, Dr. Hunter. We appreciate it.

Dr. HUNTER. Yes, sir.

TESTIMONY OF DIRECTORS OF NATIONAL LABORATORIES

Senator JOHNSTON. We are very pleased now to have some directors of our national labs. We have talked about our national labs in such glowing terms that I need not add to that. This is very short notice, but a great opportunity for me to have our distinguished directors here. I appreciate your coming. With a short notice, I'm sure you don't have written statements, and frankly, we like that better.

We have Dr. Alan Schriesheim, Dr. Alvin Trivelpiece, Dr. Sig Hecker, and Dr. Burt Richter, four good friends. Why don't in a few minutes each of you say what is on your mind, what we need to know on this committee, paint with a broad brush?

Burt, why don't you start if you will? You know it always dangerous for a member of the Senate to try to read anything scientific or whatever. But if you would help explain to me in a few words what I don't understand about the uncertainty theory about why in measuring something quantity changes. If you can explain that in a few minutes, I would be very interested in that. I know that doesn't have anything to do with this hearing, but I would be delighted to hear your answer.

STATEMENT OF DR. BURTON RICHTER, DIRECTOR, STANFORD LINEAR ACCELERATOR CENTER

Dr. RICHTER. I sort of regard this as a test, can I do that. [Laughter.]

It is really not a very complicated story. It is just that the things that you are measuring at the quantum level are so small that the measuring device interacts with them.

Suppose you want to measure where something is. How do I do that? It is so small. I have to have something bounce off of it and come back to my measuring instrument. Otherwise I don't know it is there. So, I bounce something off, and that thing comes back to the measuring instrument. When it bounces off and comes back into the instrument, it changes the state of motion of the thing that you were trying to measure.

You can make all this quantitative and get a limit on how precisely you can measure a position and how much change in motion you have to do to measure it that way. That is the uncertainty principle, and it says that the uncertainty in the position times the uncertainty in the momentum is disproportional to a constant, a quantum constant.

So, if I want to measure at finer precision, I have to use shorter wavelength light because I want to see it better. Shorter wavelength light is higher energy light. The higher energy light, when it bounces off, knocks it further away.

Senator JOHNSTON. Hawking did not make it nearly that simple or understandable. So, thank you very much.

Dr. RICHTER. At least you didn't ask about superstring theory. I would have deferred to Alvin Trivelpiece on that one. [Laughter.]

Senator JOHNSTON. Well, I read about superstring theory and didn't understand that well enough to be confused. [Laughter.]

Please proceed.

Dr. RICHTER. I thought, since I was told that there was no formal agenda, that I should just mention a few things that were on my mind. Let me pick up on a couple of things that was just completed.

CIVILIAN R&D FUNDING

First, I think any laboratory director has to say the funding of civilian R&D really should be increased for the good of the Nation. I will say that and put it on the record. You know that very well.

When we talk about the United States, compared to its global competitors, we have to remember that the fraction of GNP that they spend on civilian basic R&D is bigger than the United States, and it hurts.

TECHNOLOGY TRANSFER

There was some discussion of technology transfer and laboratory-industrial cooperation. Technology transfer is frightfully difficult. Even within American business, technology transfer from their research arms to their production arms is very difficult. While I am a high energy physicist, I have always been interested in this sort of thing, and so I have done some consulting for big companies like General Motors and venture capitalists on how you start things up. It is amazing to watch.

Transfer of technology from laboratory to industry is not something which is easy to mandate. Technology has to be really sold to American industry. You have to convince them that they need it, and you have to convince the production people and the management people. It is very easy to convince the research people, but they have a pretty hard time convincing the production people and management people as well.

American industry does not have the same long-time horizon that either Japanese or European industry has, and it also doesn't have the same habits in funding technology transfer. For example, in Japan you will find the companies often write off large parts of the costs of item No. 1 of some new technology just to technology transfer. What you pay for item 1, if you are working with them from a Japanese laboratory to a Japanese company, may be less than what the company will charge for item 2 when it feels it has absorbed the technology and now knows true cost. In the United States, you always wind up paying the full cost of item 1. That is the way American business works. We are not going to change that. Nothing the labs do is going to change that, and I don't think anything you do is going to change it either.

I think you have to recognize that technology transfer is expensive. It is going to cost the laboratories money to do it. It is going to cost the laboratory money because to work with a company, instead of doing it with our own in-house staff, they are going to have to pay for all sorts of up-front costs. It is an investment that is worth making, but it isn't cheap and it isn't easy. And to just add to the mission statements of the laboratories you should do something to transfer technology, isn't going to make it happen. The extra funds required to do it have to come from someplace.

X-RAY LITHOGRAPHY TECHNOLOGY

X-ray lithography was mentioned. It is a very interesting example. I went through in 1977 trying to transfer that technology to industry. A group of us took the storage ring technology and tried to convince IBM and Intel and Motorola and Texas Instruments, a huge, long list, that they should really build these things and start to use them. No sale. Only two companies had the very long-time horizon then to begin to work, and those are AT&T and IBM. And they could have that long-time horizon because they are so big they could just afford it.

At the present moment in the United States, only one corporation has ordered a synchrotron light source, and that is IBM, and it ordered it 2 years ago. The other companies haven't done it yet, and they are not sure that they can afford it. They are waiting for it to be proved better.

I don't know how we are to get around this, but the way we are going to get around it best using talents of the laboratories is to probably have laboratories of the DOE fund technology projects in cooperation with industry to do demonstrations of a particular technology, and those technologies have to be things that the production people and management are interested in.

That is a long few minutes, but it was a theme of the hearing that was just completed. It has been on my mind for some time. It is not high energy physics.

Senator JOHNSTON. Well, thank you very much, Dr. Richter. I know you have to catch your plane. So, let me just ask you a couple of questions before you have to go.

R&D FUNDING

First, I very much agree on your theme on R&D. I think really from a congressional standpoint, we have too little coordination and too little overview of R&D in general. We have a proliferation of responsibility for that among a number of committees. We rarely have a comparison type of analysis.

Our requests for R&D money come from specific groups. SLAC wants specific money to do specific things, NASA to do the space station, et cetera. We don't have the opportunity to sit back and say, well, are we spending enough on research in general, and how do these various fields compete in order of priority because these things must be prioritized. At some point we ought to create some congressional mechanism of those things.

You heard the exchange on magnetic fusion. That is a very real competition there, not that it must be in competition with SLAC necessarily, but it has to be in competition with everything in the energy and water budget because it is a finite amount of money which we will get from our 302(b) allocation. Even beyond the 302(b) allocation and the energy and water bill, there ought to be a bigger competition with the total budget. And there will in one sense.

People tell me, well, you ought to be for so much in Medicare and so much for the space station, et cetera. I say, look, the real question and debate there has to be related to the 302(b) allocation process—how you divide the pie going into the committees. Much of those judgments are done on a very, very superficial level, as you know. If it is considered at all, it is very superficial. A lot of these scientific endeavors will be sold or defeated on pseudoscientific arguments for the most part, and I am sure you have seen that time and again and at great frustration.

It is frustrating to me, even as one who has the opportunity to talk to the experts, because it is such a surface level examination even given the knowledge and opportunity which we have in this committee. I would like to have at some time a better means of assessing these competing values and programs. If I could go to the Congress and say we need another $10 billion for scientific research, and they would say yes, I wouldn't know precisely where to put it, not that we would lack for advice on where to put it, but it would be difficult to do.

So, I would seek your advice in the future. You may not have time between now and the time you catch your plane to advise on how to make those comparisons, but I would seek your advice on that as well as how to use the national labs as the defense mission changes, if it changes.

SCIENTIFIC PRIORITIES

Dr. RICHTER. I would like to talk with you in a more extended fashion on these items, but let me briefly respond to the question about priorities.

We have a terribly messy and clumsy system, but it is not bad. There is no group of scientists who can decide on priorities between fields of science. If Al here is a chemist and I'm a high energy physicist, he's a chemist because he loves chemistry, I'm a high energy physicist because I love high energy physics. There are limits to how altruistic I will be in a budget crunch and support chemistry over high energy physics.

We have mechanisms which now are spreading through the Government to decide priorities within fields. High energy physics developed such a mechanism early. Nuclear physics has it now. Basic energy science is getting the same sort of committee structure. Scientists are well qualified to advise on priorities within fields. A high energy physicist should say that this is important and that, while good, is less important, and that kind of information you need.

How to decide between fields is now done in a political arena, and that, I believe, is where it belongs. The question of whether to fund the human genome or to build the SSC or to start on the space station is not a question resolvable by scientists. All of these are great projects. The people in the fields have said they're important to their fields. We have to leave it to you, Senator, and to your colleagues to try and find a way to do that.

I wish it would be neater. I wish Congress would rearrange its committee structure and not make it so chaotic and fragmented. It is very dangerous for people to criticize Congress, but I wish they would do that. But I think these questions are being resolved in the right place.

Senator JOHNSTON. Well, I don't think there is a way to get it out of the political process, but the political process needs to be better organized. We can reorganize that process at least within—I mean, for example, on global warming we can—as I was asking Dr. Hunter, we need to design hearings with the right people so we can hear within that discipline from scientists who hold opposing views. We need as best we can to design other kinds of hearings to help evaluate and examine other competing activities.

You know, sometimes scientists may not be in exactly the same field, but they can look at somebody else's science and say, well, it's not all that good. You don't have to have a contract from SDI to be able to evaluate whether it will work or not or whether a particular technology is usable. Indeed, some SLAC scientists have helped us with that. That is very much related to your field.

Thank you very much, Burt.

Dr. Trivelpiece.

STATEMENT OF DR. ALVIN TRIVELPIECE, DIRECTOR, OAK RIDGE NATIONAL LABORATORY

Dr. TRIVELPIECE. I would like to add a little bit to what Burt was saying in that scientists and engineers, by and large, tend to be apolitical; that is, you do not find them in the places where envelopes are being stuffed and telephones are being answered or at fund raisers or things like that. They tend to not be part of that process.

I have written several editorials in science and given a lot of talks. Every time I have given a talk, I have tried to end it with make this the year that no candidate for any elected office anywhere in the United States with whom you have contact gets elected without being asked what their position is on science, technology, education, SSC, global warming, and so on. We don't do that, and I think until we begin to collectively ask those questions and take a hand in the political process, there will always be difficulty in coming to grips with the kind of decisionmaking process that you were talking about. I think Burt said it precisely right, but the next step is that we have to begin to play in that arena and we haven't. It is our own fault.

Senator JOHNSTON. Would you care to add some comments in brief?

Dr. TRIVELPIECE. Well, as you might well expect, this was an exercise in frustration sitting in the back row there, because every time you asked a question, my temptation was to answer it, since I was the former Director of the Office of Energy Research. I did restrain myself. I didn't lean forward.

Senator **Johnston**. Please don't restrain yourself now.

Dr. **Trivelpiece**. I did want to touch on just a couple of points.

UTILIZATION OF NATIONAL LABORATORY CAPABILITIES

As Bob Hunter mentioned, the Secretary did have us in there this morning. We all applauded the fact that he reiterated statements that he has made to you during his confirmation hearing on education and on the use of the laboratories as a tool to help inspire our youth to pursue careers in science and technology, which I think, is the right thing to do.

Most of the laboratory directors and many of the members of the staffs of the laboratories have been desirous of doing this for some time. We have done it on the margin. The amount of funds dedicated toward it is small. It has been pretty much a voluntary effort. But it has been extremely effective, and I think it could be made more so.

I wanted to leave a thought in that conjunction, and that is that technology transfer has come up here rather frequently. I submit it may not be one of those things that you can put a quantitative factor on, like how many patents or how many products or so on, but every high school student or grammar school student that visits the laboratory or works there for some period of time takes away some piece of knowledge, and that is an element in the technology transfer program. It has a very long reach. It may be 20, 30 years before it pays benefits. But it will pay benefits. You can find people today who had brief experiences and contacts or extended ones with laboratories in the past that have caused these kinds of things to occur. It really pays off well.

So, I think the laboratories are underutilized in this role of educating students or inspiring them to pursue careers in science and technology, and the demographics is clear. Everybody understands it. We need to do it, and this is one of the tools by which it could be accomplished.

Senator **Johnston**. I would like the labs to be more entrepreneurial in terms of projects in which they might be able to use their expertise, their equipment, their abilities to solve particular problems. You don't have to submit it. If it is embarrassing with the administration, use the back channel, but I think we ought to use the labs.

To say they are great national assets, I agree. To say they have great capabilities, I agree. But a committee can't very well decide where that capability ought to be used. As I say, I would like the labs to be more entrepreneurial and look at particular areas where you might be very good, whether it be nuclear waste or nuclear cleanup or doing a lot of different things that would be helpful in R&D or international competition or wherever.

HUMAN GENOME

Dr. **Trivelpiece**. Well, you have mentioned many of them. Of course, the genome is one which I do agree is very important. As you may recall, I had a hand in getting that started, while I was at the Department of Energy. I think I made a tactical error, from DOE's point of view, in allowing the word human to be attached to it because part of the purpose in that was to be able to, at the molecular level, begin to look at the consequences of long-term, low-dose radiation and chemicals and the way by which you go about doing it is understanding those processes at that level. So, therefore, you need to have some kind of a map or sequence of genetic function.

The problem is, as has been mentioned, there are 3½ times 10 to the ninth base pairs in the genome. Now, if you imagine taking each one of those pieces of information and putting it on a 3 by 5 card and throwing it here in the room, we would have a room full of cards. Then if you start trying to put that into some useful format to take advantage of it, you would literally be years finding any convenient correlation.

So, how you start mapping that into an archival data base is a very important feature. One of the things that troubles me is that NIH is not noted for its skill in large-scale data base management and the use of computers to help them in that regard, whereas the DOE's national laboratories are.

So, on the one end, it is an information processing problem. On the other end, as Dr. Hunter mentioned, it is science and technology, how do you do the mechanics of making it cheaper. There is a biological element to it and, indeed, a good plan to cooperate between the two is useful, but I think——

Senator JOHNSTON. What should we do? Write into the law that it shall be under the aegis of a particular national lab?

Dr. TRIVELPIECE. No; I think that the thing to do is insist that the right kind of cooperative arrangement in which the skills and talents that the various groups bring to the table are taken appropriate advantage of. The DOE laboratories obviously can't do it all, nor do I believe NIH can do it all, and the right kind of agreement needs to be worked out. But it is not simply because it's called human the exclusive province of the National Institutes of Health.

MAGNETIC FUSION

Senator JOHNSTON. Moving on, do you have any advice for us on magnetic fusion?

Dr. TRIVELPIECE. Well, I was entertained because many of the questions you asked Dr. Hunter, you have asked of me in the past. I think he answered them within the framework of the administration's view on these things.

I think I would have only added that this 20 or 30 year number that keeps coming up—it is interesting to point out that in 1952 or 1958, the answer was, yes, it's going to take 20 or 30 years to make fusion realized. The answer to that question today is the same.

But if you notice, the content of the question has changed rather substantially because in 1955 or 1958, you didn't know whether or not you could create, confine and heat a plasma to a temperature in which the amount of energy released would be approximately equal to the energy required to cause that to come about. Today the answer to that question is, yes, you can do that.

Now, given that you can do that, can you now convert that into some kind of a practical energy generating scheme? Well, indeed, that takes some period of time, probably comparable to the period of time that has already gone past. But it is not that no progress has been made. Rather startling and I think remarkable progress has been made over the years. It is a tough technology problem from this point forward.

Now, it was mentioned that our program is approximately equal in size to the programs of Europe, the Soviet Union, and Japan. They are investing in it much the same way that we are in that I believe you cannot afford not to maintain contact with the leading edge of this field because it may, indeed, work as well as those who have been most optimistic about it claim that it will, in which case then we need to be within striking distance to be able to take advantage of it.

Whether or not generating electricity is the most important thing to do with it I think remains to be seen. The first step is to be able to generate a copious supply of 14 MeV neutrons, and then it may be that this would fit into the scheme of breeding for light water reactors or using neutrons for processes that none of us have yet conceived of. There are certainly useful things that can be done with neutrons, other than making fissile material, breeding it or making electricity.

I think it is an essential thing to do just to learn about it, and that the progress has been realistic.

Now, the specifics of going forward with CIT or not going forward with CIT, of course, are complex. I am not in a position to enunciate the administration's position at the moment, but I think that it is an important thing to do. Then it gets into the question of the rate at which you do it.

Senator **Johnston**. And the priority.

Dr. **Trivelpiece**. And the priorities, as compared with other projects which the Department and the Government sees fit to pursue.

Senator **Johnston**. Are you up to speed with the magnets on SSC?

Dr. **Trivelpiece**. No; I am not.

Senator **Johnston**. Do you have anything to advise us on global warming? Is your opinion essentially that of Dr. Hunter, or do you disagree?

COLD FUSION

Dr. **Trivelpiece**. I have studied this material, and I would say that his opinion is very close to mine.

You mentioned cold fusion. To some extent there may be some parallel between those two if you think about it. On one hand, somebody makes a claim about cold fusion, Fleischman and Pons, and immediately the scientific community sets about to confirm or refute those results. It turns out to be very difficult to do. But here is a very narrow, well-defined subject area in which you can look at it and either prove it or not prove it.

In the case of global warming, you are dealing with diffuse data, widely distributed, poor temporal correlation, all sorts of problems like that in trying to draw such a sweeping conclusion. I think that the agnostic view with cold fusion and the agnostic view with respect to global warming are quite appropriate, that you should look at it and understand the pros and cons of it and understand the data. I think a hearing, such as you suggest, in which some of the proponents and antagonists of these various views are given an opportunity to have at each other is an excellent idea.

Senator JOHNSTON. I'm not quite sure what you mean by agnostic view—the doubting view, the idea that cold fusion is probably not there given what we know about it. Would you agree with that view?

Dr. TRIVELPIECE. The chances are very slim and getting slimmer that the results that Fleischman and Pons quoted are, in fact, going to yield amounts of energy that are going to be interesting or useful.

Senator JOHNSTON. Amounts of energy from fusion at least.

Dr. TRIVELPIECE. From fusion or whatever process it is that they have reported to have seen.

Senator JOHNSTON. The high probability is that it is something other than fusion.

Dr. TRIVELPIECE. The probability is that it did not result in a net increase in the amount of energy. There will be a hearing—and perhaps Dr. Hecker has been involved in this—at Santa Fe in a week, May 25 or something. All the various laboratories will be there to report on their results, and perhaps he could expand on that.

GLOBAL WARMING

Senator JOHNSTON. Is that the same attitude you have toward global warming?

Dr. TRIVELPIECE. Yes.

Senator JOHNSTON. I mean, global warming, as you know, I think was a cover story in Time magazine. Those witnesses testified before my committee, and they were very persuasive. I think we had four witnesses, Goddard Space Lab, distinguished witnesses who all seemed to say global warming is here.

Dr. TRIVELPIECE. You stated the facts very correctly. There has been an increase in CO_2. It is well-documented. I don't think there is anybody who disagrees with that. There is a conclusion that that predicts an event, and if you take the current atmospheric models, that would predict a degree C rise over some period of time, if the CO_2 growth were to continue.

Now, whether or not that will occur depends on a collection of things which involve some very interesting feedback mechanisms. For instance, half of the CO_2 disappears into the ocean, or nearly half of it, and we don't know whether or not that will continue. We don't know why it occurs. We don't know what influence it will have. So, there are substantial degrees of uncertainty in there.

But this gets back to the question, if it were to occur, given that it could be as bad as is projected, should we do something about it now or wait until we have additional information. That gets closer to a political decision than it does to scientific judgment.

Senator **Johnston**. You didn't give me a scientific judgment on the evidence about global warming.

Dr. **Trivelpiece**. No. I think, as Dr. Hunter stated it, and I have looked at some of these temperature graphs, you can pull either conclusion you want out of it depending on which set you choose to use.

Senator **Johnston**. Dr. Hecker, we were going to get you into this debate on the fusion in a jar.

Dr. **Hecker**. I certainly would also like to make some general comments.

Senator **Johnston**. Yes, please do.

Dr. **Hecker**. May I make the general comments first because I wouldn't want the cold fusion to override those?

Senator **Johnston**. Yes, of course.

STATEMENT OF DR. SIG HECKER, DIRECTOR, LOS ALAMOS NATIONAL LABORATORY

Dr. **Hecker**. In thinking this through last night, there are two comments that I wanted to make, one a rather short one on basic science, and then one to tackle this thorny issue of what one calls technology transfer.

BASIC SCIENCE

The one on basic science is just my view of the world, and that is that I see basic science in the United States as being in very good shape and not in need of an overhaul. I think as we look at our university system, of where we have combined education and research into our universities, that has served us extremely well. If we look at the national laboratories I think they have done extremely well in the area of basic research. It is essentially this pluralistic system of both funding, as well as conducting basic research, I think, is the key to success.

I would say let's make certain that we don't over-regulate basic research and let's make sure that we don't cut it because it is the engine that drives everything. I realize I'm preaching to the choir, but it is very important to recognize how much the pluralistic system has served us.

I also think that generally basic research is quite cheap. However, one does have to watch what you can call the megaprojects, and you have mentioned them here today, SSC, space station, human genome. When the levels get to those overall funding levels, then I think it is important to set the priorities. But also, as has been discussed here today, the objectives of those megaprojects certainly go way beyond the scientific scale, and that is, there are often political objectives. There are nationalistic objectives. There are economic related things and certain mission oriented goals of the different organizations. They are not simple priorities that we as scientists can determine, but we need to give you appropriate input. But clearly, the policymakers have to make those decisions.

So, when it comes to the major projects, one has to set priorities. When it comes to research in general, let us let the pluralistic system do its thing. I think it has served us well.

TECHNOLOGY TRANSFER

Technology transfer. My thoughts on that. First of all, in my opinion, it is somewhat of a misnomer as it is applied to the national laboratories. I often get the feeling that people come to us and view us as a supermarket, and that there's a supermarket quality to technology transfer. That is, we have all these very bright people and they think of all these different gadgets. They invent them, put them on the shelf. Then we ring the bell and tell industry to come and get it.

It turns out they don't come and get it because they know technology transfer is a people-contact sport. It takes a lot of interaction between people to move ideas into technology and interapplications.

It is somewhat simplistic of us to view the national labs to make a significant impact by doing this supermarket process of technology transfer.

I think what is necessary is a much more determined and systematic effort to look at how this country does technology policy. In fact, we don't have a technology policy. You mentioned earlier this question of industrial policy, which seems to be a word that is not well-liked in the United States. Perhaps one doesn't need an industrial policy in a free market system.

I think we are at the point where we need a technology policy. Let me just give you my impression of how I see things work now in this technology development arena which is this crucial step that we do not do well in the civilian sector. I think the Japanese do it much better. That's why they beat us to the marketplace to make the best products. As you well know, we buy their products, and with our money, they buy our land. So, it's a pretty vicious cycle all the way around.

The way we do it now is, in defense and space related applications, we recognize that the Government is the customer. We are willing to fund not only basic research, but technology development and get the development interapplications. So, we do the whole spectrum.

On the civilian end, the policy has been for years that we fund basic research—that is, the government funds basic research—and then you let the free market take over. Those companies that are able to use the basic research survive and those that don't, don't.

However, we can't play that game anymore in my opinion because today we compete on an international scale. The Japanese and many other countries develop the technology further toward the application with Government help. In Japan it used to be mostly money, but now it is just muscle in a lot of cases with a little bit of money, but a lot of coordinating. But, nevertheless, they wind up developing technology, let's say, in a generic, precompetitive fashion together. Then they go out individually and compete. They are certainly as capitalistic as we are in the United States.

But we don't do that stage, and I think we can't get away with it today because it is not a question of one U.S. company competing against another U.S. company, but it's U.S. companies competing against Japan, Incorporated.

In my opinion that is the key area where the national laboratories could help out, and that is because we are all very large laboratories. We do basic research, but we also do a lot of technology development either for defense applications or energy applications. Since we do that technology development, we would be extremely well-suited to do technology development that is in this generic, precommercial arena. If one could find an avenue to get that technology essentially pulled by the market—that is, to get the industrial folks involved in telling us what technologies are important to them to be competitive—and if they helped to guide that and to some extent cosponsor that technology development, working with us closely at the early stages of technology development, then we would have an opportunity to help out U.S. industry significantly.

Senator JOHNSTON. Well, as I say, I think we need for you to be more entrepreneurial in your capabilities. Things that come to mind are HDTV, for example, which is now being done by DARPA, I think, only at $30 million.

By the way, you say the Japanese don't put as much in R&D. I think they are putting $1.5 billion in R&D into HDTV.

Dr. HECKER. Yes; at least.

Senator JOHNSTON. So, they do put a lot in in that initial phase.

This may not be appropriate, or it may be, but we need advice if we are going to use the national labs. We shouldn't figure out the Los Alamos or Sandia or wherever ought to be doing a particular thing. You ought to give us advice as to that and let us choose.

Dr. HECKER. Let me just expand on those remarks a bit and I'll finish in a second. But you've touched on a subject that has been dear to my heart for a number of years.

I think the way to do the choosing is that one has to concentrate on a few strategic technologies where we know for civilian applications, as well as for defense applications, they're important to the country. You can just tick off technologies like supercomputing and superconductors. You can say health and biotechnology. I would say probably in the area of materials, materials synthesis, and processing. Certainly semiconductors fall in that. This whole issue of waste management or environmental technologies would fall in that. I think the laboratories could concentrate in these areas, work it closely with industry, and help them make that transition.

In fact, just to finish it, a bit over a year ago I made this proposal to the Department of Energy to try this type of relationship with industry on a pilot basis. These are the so-called superconductivity pilot centers. In fact, the three of us represented at this table have these superconductivity pilot centers where we are working with industry trying to establish an arrangement to get the generic technology developed to the point where U.S. industry then might be interested in coming in and developing devices.

Senator JOHNSTON. Well, I think we should follow up on that and try to develop not necessarily just the high temperature centers, but the general idea. We will try to follow up on that.

Before I ask you questions, Dr. Hecker, let me go to Dr. Schriesheim because I don't want the clock to catch us and freeze him out. I would like for him to make whatever comments he would like, and then we will get into questions.

STATEMENT OF DR. ALAN SCHRIESHEIM, DIRECTOR, ARGONNE NATIONAL LABORATORY

Dr. SCHRIESHEIM. Well, it is most appropriate for me to say that I agree with all the comments that have been made by my brother lab directors. In my thinking about what I might tell you, Mr. Chairman, that would be useful in light of what has already been said and those kinds or thoughts or agonies, if you will, as a lab director of a multiprogram laboratory, a lab I consider to be one that is really characterized as a corporate laboratory for the Nation, a laboratory that we try—I certainly try—very hard to look at the horizon and see what problems the Nation has that can be solved by science and technology. I think that is a criterion that we should use in this regard.

TECHNOLOGY TRANSFER

In that spectrum of problems that can be tackled by science and technology, there is obviously a whole spectrum that resides under this rubric of technology transfer. How does the United States use its national laboratories as an asset in international competition and this global competition where this country no longer has a lock on brains? Brains are all over the world, and we happen to have a particular concentration of them in the national laboratories. So, how to mobilize those effectively in this national competitive and international competitive situation is something which concerns me as it does you.

The only wisdom I would have on that particular subject from the national lab's standpoint, from my own standpoint, is that we deal across a number of interfaces in the laboratory. I agree with Dr. Hecker that there are people who look at the labs as a one-stop shopping center. And, of course, in a certain sense they are that. We deal with the individual entrepreneur, one of our own people or someone on the outside who has just that one idea that might turn into another xerox. We deal with those midsize companies that have staffs that I would characterize as attempting to couple in our own hi-fi system with their 1920 telephone system. Then, of course, we deal across that interface that is the IBM and the AT&T and the DuPont, which we do very well in terms of generating a relationship.

Under any circumstances, the people transfer the fact that industry, I believe, because of all sorts of factors, is more willing to leverage its resources now. There is more of an ability to deal across those multiple series of interfaces.

We can take what Dr. Hecker mentioned earlier, the superconductivity pilot centers. We are saturated. We have more companies that want to deal with Argonne on superconductivity centers than we have money to develop programs. I'm sure the same is true with these other institutions. They are hanging on the chandeliers to get into the laboratory in order to work with us. So, it is a sign that we can, as a Nation, actually do something. We can debate whether we're doing enough or not enough or how to do it, but we can certainly do something.

NATIONAL LAB FACILITIES

Another issue I wanted to mention, because it is certainly high on my scan, has to do with the facilities within these national laboratories. The laboratories are clearly a central facility operation, organization, resource, that is utilized by industry as well as universities. That bears on this whole national competitive situation. My own laboratory happens to have an initiative, a facilities dominated initiative.

But it falls under what I would call the aegis of strategically planning a scientific facility that gives this country competitive advantage. That is different than technology transfer in the sense that one looks to see if you have inside a gadget or a widget that has just been made that can be transferred to another company, the strategic planning of facilities that can give this country a competitive advantage. I urge the committee to look on that as an investment-related opportunity, an investment in the country's future.

The final word I guess I have is not something I'm too sure the committee can do something about. It is just an agony perhaps we all have in this technical community, and that has to do with the ability to articulate to our population the issues of the day in technical terms.

NUCLEAR ENERGY ISSUES

Last night before I came to Washington, I gave a talk on nuclear power because the laboratory also is involved in nuclear issues. We have an advanced reactor, or a leaf in the advanced reactor portfolio. I am ceaselessly amazed at the lack of knowledge that supposedly sophisticated people have on important issues of the day that have technology ramifications to them such as the nuclear power, nuclear fission, nuclear fusion issues.

That is an educational matter that we don't seem to handle too well in this country. I don't know. It begins perhaps at the preschool, high school, college level, and it is one that we are all involved in. In terms of the way you expressed the question to me, though, and that is to come and talk to this committee about issues that concern me, that particular issue concerns me a lot.

Thank you.

Senator JOHNSTON. That particular issue concerns me a great deal, and frankly it is a vicious cycle. You have, first of all, the press that on nuclear issues is looking for the sensational. The sensational is always that most extreme statement of the available statements or the available opinions which will be given high priority in the press and then exaggerated.

You can have one rem of radiation released which is not enough to kill one out of a million sparrows who flew directly into it, and yet there will be big headlines of nuclear radiation released. Someone says it is not very much, but another distinguished scientist there is no lower level for what is acceptable radiation. So, how can we be asked to accept this risk. The thrust of the typical article will be to exaggerate out of all possibility, out of all realm of reason, the results. It makes it very difficult. Nothing is risk-free.

This country has gone into what I call the cyclamate complex. In a very nonscientific way, we make scientific decisions which have huge implications for our society. In the process, we have been squandering our national resources. It is not written in history somewhere that this country will remain the leading country in the world if we continue to squander our resources. Indeed, competition from other countries is already so keen that we are no longer the leader in many fields.

The Congress plays an important role in that. Of course, the Congress in turn feeds the press and the press feeds the Congress and the public believes both. It is frustrating. To have distinguished scientists make nonextreme statements about a subject like nuclear energy will never make the press.

Dr. SCHRIESHEIM. No; we seem to be in a world in which you have to be a famous actor to have any technical credibility, I think, Mr. Chairman.

Senator JOHNSTON. I think you're right. [Laughter.]

May I get a statement, before we get too far away, on fusion in a jar—cold fusion. Agnostic, Dr. Hecker?

COLD FUSION

Dr. HECKER. We are going to have a workshop next week in Santa Fe which will bring together many hundreds of people to take a look at the latest evidence. As you know, the physicists got together some weeks ago, the electrochemists a bit over a week ago. At this point, we will have just scientists getting together, both physicists and chemists, and look at the latest evidence of what we have.

I must agree with Dr. Trivelpiece's comment that in terms of large scale energy generation, I haven't seen anything yet that would indicate that that is essentially at hand. I think in terms of interesting physics phenomena or chemical phenomena, that remains to be sorted out.

We have a handshake agreement with the University of Utah for almost a month now to have Los Alamos National Laboratory help them do some sophisticated diagnostics, for instance, seeing whether we can count neutrons. That's a very tricky business. We have been in it since the beginning. We think we know how to count neutrons. We have offered to help them out to count the neutrons.

As I said, we have had a handshake agreement, but unfortunately their legal folks got involved, and we still haven't made it up to the University of Utah because they are not able to get legal things resolved. It is terribly unfortunate because I think the world needs to have a resolution of what is really there. It is clear there is enough black magic involved in the electrochemical aspects of this process that, to understand exactly what was done, it is going to be necessary to try to reproduce or really refute the issue. So, it is not resolved.

GLOBAL WARMING

Senator JOHNSTON. Global warming, agnostic?

Dr. HECKER. I think both Dr. Hunter and Dr. Trivelpiece put it extremely well. With the current data, you can go in either direction. It seems to me that some of the steps to prevent dumping excess CO_2 and burning the fossil fuels are probably things that one needs to consider now. So, in terms of our energy production, those are the things we should consider, regardless, because they also contribute to a number of other ills. But in terms of exactly where are we in global warming, I would have to agree with previous comments.

Senator JOHNSTON. Do you agree with that, Dr. Schriesheim?

Dr. SCHRIESHEIM. Yes; I do with emphasizing something that Dr. Hecker said; that is, that for additional reasons, the issue of energy security, environmental issues that concern acid rain possibilities, a lot of environmental issues, it would seem to make sense to certainly work in areas such as nuclear fission which have the advantage of impacting not only on the production of carbon dioxide but on these other arenas as well. But in terms of the specific of whether the temperature is rising as a result of the CO_2 production, we need to generate more data to really make sure that specific is true.

SUPERCONDUCTING SUPER COLLIDER

Senator JOHNSTON. I know that all of you are in favor of the superconducting super collider, and the proof of the unity theory is not necessary for its funding. But could you give me a quick, just a couple of words—a vote has already started, so just a couple of words, a view of whether you will be able to prove the unity of the four forms of energy from the SSC? Dr. Trivelpiece?

Dr. TRIVELPIECE. You mean the forces, the weak force, the strong force, and so on?

Senator JOHNSTON. Yes.

Dr. TRIVELPIECE. Well, if you start backward in time, you go toward the big bang. The question was at that time, what was physics like. One of the analogies that is used, you imagine you have a sphere full of water vapor, which is a gas. So, you have one law of physics, just simply the law of gas, like marbles existing in a sphere. But if you cool that down a little bit, you end up with water vapor and water. You now have two laws of physics, one for fluids, one for gases and——

Senator JOHNSTON. Well, I reasonably understand that, but can you bring the four forces together with a mathematical formula to relate gravity to electromagnetism?

Dr. TRIVELPIECE. Well, that is what is unknown and that is one of the things that the SSC is supposed to do. As higher and higher energies have——

Senator JOHNSTON. Do you think you can do it, though? That is the question.

Dr. TRIVELPIECE [continuing]. Been made available, you then get the experimental evidence which confirms certain theoretical predictions.

Now, the W plus and minus particles, for which people got Nobel Prizes a few years ago, were in fact predicted theoretically on the standard model.

Senator **JOHNSTON**. You are saying you think we can prove the unity theory with the SSC. It will not take further generations of machines.

Dr. **TRIVELPIECE**. Including gravity, that's another more problematical issue. But, yes, I think progress toward.

Senator **JOHNSTON**. Progress toward, of course.

Dr. **TRIVELPIECE**. Progress toward. You are asking the question in a very difficult and particular way, and I understand why you are doing it. But the theory, the standard model, predicts objects which have 1,000 proton masses instead of 80 proton masses, as were already observed. But whether or not that is right cannot be determined on the basis of just theoretical considerations at the moment. It requires new experimental data.

Senator **JOHNSTON**. I think what I am hearing is probably not with this machine, but we will make progress toward it.

Dr. **TRIVELPIECE**. We don't know. If it produces 1,000 proton mass objects, that will or will not confirm certain features of the theory. It may, in fact, cause a whole new view of the world to be obtained. It may be simpler or it may be more complicated, but from this vantage point, you can't say which.

Senator **JOHNSTON**. This is not the decision point of the SSC I want you to understand. It doesn't depend on this. I am just interested.

Do you think, Dr. Hecker, that we will go all the way?

Dr. **HECKER**. I think it is the necessary next step. It will probably open as many questions as it answers. It is just an evolution of our understanding of the universe. I don't think it is going to answer all the questions in the world.

Senator **JOHNSTON**. And you won't have a mathematical model of the unity theory.

Dr. **HECKER**. I don't believe it is going to have it all come together to make it a nice, simple model. We are going to learn a lot more about how the world works.

Senator **JOHNSTON**. Do you agree with that, Dr. Schriesheim?

Dr. **SCHRIESHEIM**. Sir, I'm in the fortunate position of being a chemist. So, I will defer to these two gentlemen on my left.

Senator **JOHNSTON**. Well, to be able to tell my colleagues who are agnostics on the question of SSC, would you like to have maybe 1 minute—that is about all the time we have left—to say why we ought to build it?

Dr. **TRIVELPIECE**. Why we ought to build it? Because I think it will be one of those tools which will inspire youth in this country to pursue careers in science.

If you go back to the middle 1930's and you looked at positrons, and you asked, what in the hell good are positrons? I want an accelerator to study them. That is a ridiculous thing to do. Those were pretty abstract. And yet, today the ability to penetrate Alzheimer's syndrome depends on the use of positron emission transaxial tomography. Fortunately, people spent the money and had the understanding back then.

I submit that, standing here today and looking forward with quarks, gluons, and leptons or the quark structure of matter is no more or no less abstract than positrons were in the 1930's. It's a natural evolution to try to provide some frontier for our young people to pursue. And this is it.

Senator **Johnston**. Dr. Hecker.

Dr. **Hecker**. That is so beautifully stated that I won't quarrel with it.

Senator **Johnston**. Well, it is a fascinating field. I wish we could talk about that and other things a lot more, but we have to go vote on Pete Domenici's budget which will contain your budgets as well. So, I better get over there and vote.

PREPARED QUESTIONS SUBMITTED FOR THE RECORD

We have questions from Senators Hatfield, McClure, Domenici, and Burdick which will be made part of the record for your response.

[The questions and answers follow:]

QUESTIONS SUBMITTED BY SENATOR MARK O. HATFIELD

Nuclear Medicine/PET Scan

Question: Dr. Hunter, before I proceed, I just want to clarify one point. Am I to assume that the "MEDICAL APPLICATIONS" activity, which appears in Volume 2, page 346 of your budget, is what we used to call the Nuclear Medicine program?

Answer: Yes, the budget item "Medical Applications" is what had been called "Nuclear Medicine." The change was made to reflect the broader scope of research underway, e.g. boron neutron capture therapy, synchrotron angiography, than is implied by a more conventional definition of nuclear medicine interests.

Question: The Department's request this year assumes a modest 3% increase above last year's appropriation ($36.6 m vs. $37.7 m). Could you tell us what the current status of activities are under this program?

Answer: The medical applications program is actually increased by 7% if the boron neutron capture therapy program (BNCT) at Idaho National Engineering Laboratory is excluded from the totals. A 7% increase to the remainder of the program provides reasonable growth for this important program and allows for budget deficit reduction considerations. Fifteen new projects are being funded in FY 1989, mostly in the areas of positron emission tomography, single photon emission computed tomography, and monoclonal antibody research. These were selected after review and prioritization from proposals that were received in response to a request for proposals issued in September 1988. Work formerly initiated is continuing on a broad front involving development and production of stable and radioactive isotopes, development and use of new radiopharmaceuticals, instrumentation, therapy using accelerated particles, synchrotron angiography, and uses of monoclonal antibodies in diagnosis and therapy, as well as the continuation of boron neutron capture therapy studies.

Question: Regarding the on-going research with Positron Emission Technology (PET Scan) within the nuclear medicine program, could you please up-date us on the level of funding for that specific activity in FY 89 compared to your request for FY 90? How many different PET technologies are being pursued at this time, and how many different universities are involved?

Answer: The FY 1989 and FY 1990 funding for PET projects is $10.6 million and approximately $12.0 million, respectively. The PET technologies being pursued include instrument development, radiopharmaceutical development, applications in brain and heart imaging, imaging of tumors using monoclonal antibodies, and quantitative studies of radiopharmaceutical kinetics. Twelve different universities are involved.

University Research Support/Science Education

Dr. Hunter, as you may know, many of us been strong advocates for science education, government-wide in NIH, NSF, DOD, the Education Department and have always been proud of DOE's role in promoting science education through its national labs. Our national military security, our international trade deficit, many of our basic societal functions are dependent on increased literacy in all fields of science.

Question: Volume Two, Page 463 of your budget justification even cities the White House Science Council report emphasizing DOE's leadership role in science education through the national labs. Why then is the Laboratory Cooperative Science Centers program targeted for a 39% cut in FY90 ($15.4 m vs. $9.4 m)?

Answer: The Department remains fully committed to a strong science education effort at all levels of education. Our Laboratory Cooperative Science Centers Program continues to provide support for precollege students and their teachers and university students and their faculty for participation in laboratory-based research and related education activities. The 39% reduction in the FY 1990 total request from the FY 1989 level reflects the fact that, as in the FY 1989 request, funds are not included for the continuation of the University Nuclear Engineering Research and Education Program. The Congress added $6 million in FY 1989 for these activities. All other Laboratory Cooperative Science Center Program activities will be funded at the same levels as in FY 1989.

Question: What types of programs will be terminated? How many universities or students will be affected by the cuts?

Answer: With the funds available in FY 1989 for the support of university nuclear engineering projects, fifteen new university nuclear engineering research projects were funded along with a number of laboratory-based faculty and student nuclear-related education projects. Support was also provided for faculty and student use of university research reactors for nuclear engineering and nuclear science research. Overall, approximately 80 faculty members and 140 students will be supported in FY 1989. Funds were allocated in FY 1989 to ensure that the research projects supported will be continued for two years. The number of competing priorities in the development of our FY 1990 budget required us to make some tough choices on which programs would be continued. We do expect to continue support for laboratory-based faculty and student research appointments in FY 1990 in nuclear engineering as part of our regular Laboratory Cooperative Science Centers Program.

Question: Are we not losing a critical marketing tool to encourage young scientists to pursue careers with the national labs that already are facing a crisis in human resource capabilities?

Answer: On May 18, 1989, Secretary Watkins discussed the importance of laboratory programs aimed at encouraging young people to pursue careers in science and engineering. He praised the on-going programs at the labs, focused on undergraduates and graduate students, and challenged the laboratory directors to develop initiatives, in partnership with the private sector, on the innovative ways to inspire all levels of America's youth to enter and stay in the science and technology pipeline. This included challenging the laboratories to propose innovative programs that can reach our inner cities and impact the high drop out rates of minority youth. As Secretary Watkins testified before the House Committee on Science, Space and Technology on May 24, 1989, he believes the laboratories are a critical tool in encouraging potential young scientists and technicians to pursue careers in science, mathematics, and engineering.

In addition, the Department is also concerned with the status and outlook for the nuclear engineering labor market and has asked the National Research Council to conduct an intensive study for us on the status of nuclear engineering education in the United States. This study will include estimates of future needs for nuclear-trained engineers over the next 15 years for both government and commercial purposes. We will also review the need for additional support for university nuclear engineering research in the preparation of the Department's FY 1991 budget request.

Non-Lab States/Battelle NW Labs

Dr. Hunter, on a related matter, I am sure you recognize that a number of DOE Lab states are represented by Members who serve here on this subcommittee and on the Full Committee, but some states like Oregon have enormous research capabilities within their university structure but don't necessarily have a strong relationship with any of the DOE labs.

For example, Oregon, is one of the top ten states in the nation in environmental research (both water and atmospheric research); we have a very mature material science research community centered about the specialty metals industry (Wah Chang; Precision Cast Parts; et. al.); and are internationally distinguished in a variety of electronics and medical research applications as well.

Question: Can you recommend to us how states like Oregon can "plug into" the DOE laboratories to share research capabilities and ideas on projects of mutual interest? Are not the laboratories themselves going through a major transition for which they need to broaden their research base and develop better ties with industry?

Answer: The Department is working to make the private sector and State economic development offices better aware of the technology transfer at its laboratories. A recent Departmental report, Technology '88, designed to promote technology transfer interactions at the laboratories, is attached. Of special relevance is a conference being held in late June 1989, at DOE's Los Alamos National Laboratory, TECH-LINK '89, to encourage the State economic development offices in interactions with our laboratories. Economic development managers and science advisors from the 50 States have been invited to meet with representatives of DOE and our national laboratories to learn how to access the laboratory technology. In addition, the Department recently hosted a policy forum on technology transfer with 70 high level representatives from American industry to promote industry-laboratory collaborations and to identify obstacles to such collaborations. Most importantly, we have underway a 2-year pilot technology transfer project to streamline industry laboratory collaborations: the High Temperature Superconductivity Pilot Centers at ANL, LANL, and ORNL. Our follow up to the pilot project will be broad application of simplified processes. The research base in the DOE laboratory system already is very board and is a good resource for technology transfer. We are encouraging better ties between our laboratories and industry.

Question: Specifically regarding the Battelle Pacific Northwest Lab.....included in the Department's budget request is $6 million ($3 m for programs and $3 m for equipment) to begin a Molecular Science Research Center that is intended to be a regional user facility in Battelle's Lab in Richland, Washington. Are you familiar with this initiative?

Answer: Yes we are familiar with this initiative which as proposed by DOE's Pacific Northwest Laboratory (PNL) is comprised of an Environmental and Molecular Sciences Laboratory (EMSL) to house the Molecular Sciences Research Center (MSRC) and to support PNL as an Environmental Center of Excellence (ECE). The FY 1990 budget request would strengthen existing theoretical and experimental programs in molecular sciences at PNL. The total PNL initiative is being evaluated by DOE.

Question: Please tell the Subcommittee, now or for the record, about the specific mission of the Molecular Science Complex? What types of basic and applied research fields will be affected by its research?

Answer: PNL proposed the EMSL and MSRC to support instrumentation intensive fundamental studies of problems that cut across the areas of environmental and molecular sciences and involve chemistry, biology, environmental and materials research programs. The EMSL would provide a facility to integrate experimental and theoretical sciences and the application of results in models of complex environmental processes through use of advanced information and computer technology and scientific equipment.

Question: What will be the anticipated staffing levels; the out year budget requirements, including funds for construction, and; what will be the annual operating expenses when complete?

Answer: The proposal submitted to DOE for evaluation would consist of a line item construction project starting in FY 1991 with completion scheduled for the end of FY 1994. The laboratory's proposal assumes that the EMSL would include visiting academic and industrial scientists. The laboratory's research staff would be comprised of scientists, postdoctoral fellows and technical specialists. The annual operating budget at the laboratory will be determined based on a peer review of the program and facilities in order to establish the proper mix of support for laboratory staff, visiting scientists, advanced computer and information architecture systems and scientific equipment.

Human Genome Research

Question: Dr. Hunter, I am familiar with the $28 million research effort within DOE for mapping all the genes within each of the 24 human chromosomes (up from $17 m in FY89). Also, I am aware of the complementary funding in the NIH budget ($100 m in FY90 up from $28 m in FY89). But while I recognize the importance of this program to accrue potential benefits for curing birth defects and genetic diseases of all kinds, I am also fearful that science in general, whether it be the human genome project or biotechnology in agriculture, is advancing faster than our ability to fully understand the public policy and societal ramifications of that research.

What I would like to know is whether, concurrent with the on-going research at DOE and NIH, there exists an oversight panel or peer review group within the administration that is discussing the broader policy and moral implications of such advanced research?

Answer: The two Federal agencies with formal human genome programs, the National Institutes of Health and the Department of Energy, have signed a Memorandum of Understanding to facilitate cooperation and coordination of genome research and development. This memorandum establishes a joint advisory committee made up of leading scientists to provide broad scientific and policy overviews and an interagency working group made up of staff of each agency to enhance coordination at the working level.

Each agency also has its own program advisory committee and DOE has established a Human Genome Steering Committee. These groups are composed of leading scientists with the experience and knowledge needed to address broad issues.

Future Research for Nuclear Waste Cleanup

Dr. Hunter, you are not directly responsible for the DOE Weapons Complex and the cleanup efforts that are underway at many of those facilities, but many of us are very worried about astronomical costs for cleaning up these wastes. I have spoken with Secretary Watkins directly about the largest and most expensive site, Hanford, Washington, which is located right on the Columbia River, the third largest river in the country.

I am convinced that Secretary Watkins is right on the mark when he recently stated that the costs of cleaning up these sites could be substantially reduced through the development of new research and technologies. Because of the magnitude of the contamination that exists at many of these sites, research breakthroughs are not likely to relieve the financial burden we are facing, but rather will allow us to stretch the dollars that will be appropriated so that more sites can be cleaned up in a shorter period of time.

Question: My question to you Dr. Hunter, is what role can the Office of Energy Research play in putting into place the type of basic and applied research programs we need for these cleanup efforts? What types of technologies and programs could be identified in FY90 to begin these research efforts or will we have to wait until Secretary Watkins and OMB develop the FY91 budget to be submitted next January?

Answer: First, I appreciate your support of Secretary Watkins' position regarding research and development. However, DOE feels strongly that the pursuit of basic research for long term solutions, and applied research and development for short term solutions on DOE's environmental and waste management problems will result in better solutions that can be coupled with a decrease in cost.

DOE is preparing an Environmental Restoration and Waste Management 5 year plan to characterize and prioritize all environmental restoration, compliance, and waste management activities for DOE facilities. In support of that plan, efforts are being initiated on a plan of outyear efforts in Research, Development, Demonstration, Testing and Evaluation (RDDT&E). The draft RDDT&E Plan will be completed in October, 1989. It will provide an effective strategy for all Department short- and long-range research needs for waste management and environmental restoration. The Office of Energy Research and all of the National Laboratories will play a part in the development and implementation of the plan. The plan will be used in part to reaffirm FY 1990 programs and to provide a baseline for FY 1991 and outyear requests. Until the RDDT&E plan is complete, it is premature to discuss specific technologies and programs. We will keep you informed of our progress and the results of the planning process.

Question: All the Labs have excellent capabilities in these fields and the problem is certainly big enough for everyone to play a part, but because of the magnitude of the problem at Hanford, and because Hanford may very well set the pace for other cleanup efforts around the country, could you describe what specific programs and technologies could be undertaken at the Battelle Pacific Northwest Lab in Richland to begin these important efforts?

Answer: Battelle's Pacific Northwest Laboratory (PNL) has received funds over the past several years for basic research related to the stabilization, mobilization and transport of contaminants. PNL was selected in 1987 to develop the first subsurface environmental research facility and to design prototype intermediate scale experimental facilities to study subsurface problems of concern to DOE sites. These multiuser facilities are of interest to many DOE sites and to universities. Specifically, plans at PNL in FY 1990 include fundamental research experiments in microbial degradation of contaminants which in later years can be extended to demonstrations of new bioremediation and other technologies that will be important to cleanup at Hanford as well as other DOE sites. Environmental research at Battelle, which is proposed for FY 1990, is central in OER plans to develop new ideas that will facilitate cleanup at Hanford and elsewhere.

QUESTIONS SUBMITTED BY JAMES A. McCLURE

Boron Neutron Capture Therapy

Question: What is the status of the Boron Neutron Capture Therapy program that is being conducted at the INEL?

Answer: The INEL program has made considerable progress in designing and constructing a neutron beam filter, which serves to produce an epithermal neutron beam (neutrons with energies between thermal and high energy levels) while minimizing the flux of thermal neutrons, fast neutrons and gamma rays. This filter has been tested at the Brookhaven National Laboratory (BNL) and the beam characteristics measured. The large animal studies have produced data on the kinetics of a particular boron compound and on the tolerance of dog brains to the epithermal neutron beam. It is expected that in cooperation with BNL therapy trials in dogs can be started later this year. Other projects underway involve development of improved methods for boron analysis in tissues, the stability of boron compounds in blood and other tissues, and dosimetry studies.

Question: Is the Power Burst Facility being kept in a condition such that it can be effectively used in the BNCT program when the time comes?

Answer: Yes, the Power Burst Facility is being maintained in a standby condition such that if the decision is made to proceed with the necessary modifications and the initiation of therapeutic trials, the reactor can be operated safely. In particular, reactor operator training and certifications have been maintained. Preventive maintenance on critical components and systems of the plant are being continued. Hardware that would not be used during BNCT operations has been removed and scrapped. The main traffic areas have been decontaminated. A comprehensive rewrite of the Plant Operating Manual has been initiated.

Question: Please provide for the record the funding projected for 1990 and beyond until the clinical trials have been completed?

Answer: The projected FY 1990 funding for Boron Neutron Capture Therapy at the INEL is $5.288 million. Projections beyond 1990 are awaiting the completion of a peer review later in this fiscal year to determine the breadth and intensity of this effort.

Question: What are DOE's long range plans for the BNCT program at INEL? Will you extend the program to melanoma research?

Answer: If the forthcoming peer review site visit concludes that the project has had satisfactory progress and a promising future, the DOE's plans are to continue animal and other subclinical studies at INEL until the data are adequate to support a decision as to whether or not to proceed to clinical therapeutic trials. If it does not appear possible to obtain therapeutic radiation doses in the tumors without unacceptable harm to normal tissues with the boron compounds now being studied, the clinical trials will be postponed further. Studies of the distribution of boron in blood and selected tissues in dogs with melanoma have been initiated at INEL. The proposal to study the treatment of melanoma is under review.

QUESTIONS SUBMITTED BY SENATOR PETE V. DOMENICI

Human Genome Initiative

Dr. Hunter, I must let you know of my extreme disappointment in the Administration's request for the human genome initiative through the Department of Energy's Office of Health and Environmental Research. The human genome project is one of the most exciting research initiatives ever under taken by this nation. I sincerely believe this project will enable us to understand the workings of many serious diseases.

I am convinced that this initiative is central to DOE's mission since one of DOE's mandates is to understand the health effects of radiation as a product or by-product of the production and use of energy. this initiative is also central to the DOE mission because the scientific expertise to develop the technologies needed for genome analysis, to construct a physical map of each human chromosome, and to develop computer methods for handling large data sets exists in only one place in this country -- our national laboratories. I am extremely pleased to see the distinguished director of the Los Alamos National Laboratory, Dr. Sig Hecker, here today. He is one of the most knowledgeable persons in DOE to discuss the genome project.

Question: The thrust of my question, Dr. Hunter, is what priority does DOE actually put on the human genome initiative?

From the disparity between the budget requests of DOE and NIH, I frankly have to question DOE's commitment to this program. The Administration request for the NIH human genome program is $100 million, up from $28 million in FY 1989. The NIH budget request represents a 260 percent increase over the FY 1989 funding level.

DOE's budget request for FY 1990 is only $27.6 million -- just about the level of funding NIH has this year. the Administration's request for genome research through DOE represents an increase of $10.1 million over the FY 1989 funding level of $17.5 million (+36 percent), while the NIH request represents and increase of $72 million (+260 percent).

For the DOE program to keep pace with developments at NIH, the amount requested would have to be $53.5 million, or another $25.9 million on top of the budget request.

Answer: The DOE Human Genome Initiative was the first of its type in this country or abroad and was started partially in response to a report from the Department's Health and Environmental Research Advisory Committee (HERAC). This report recommended that such an initiative should be started and that the Department should take a lead role in it.

The aim of this DOE effort is to provide the biological and technical tools that are needed to describe the human genome at the molecular level. This is being accomplished mainly through the multidisciplinary capabilities of the national laboratories which are well equipped and staffed to begin the focused research and development activities required to achieve this aim.

The success of this Initiative has been given a high priority by the Department. The increased funding from $17.5M in FY 1989 to $27.6M in FY 1990 was seen as a responsible incremental increase (58 percent) and one which would allow adequate growth in effort to meet the needs of the anticipated national project.

Question: If the Administration's budget requests for DOE and NIH genome work were to be approved, wouldn't there be the danger that the basic technology needed to map and sequence the human genome, which is being developed by the national laboratories, including Los Alamos, will be shortchanged, and that progress on the overall project would be delayed?

Answer: Even though the DOE and NIH human genome initiatives are being coordinated through joint meetings and workshops by agency staffs and working scientists the budget preparations and submissions are done separately by each agency. At the time the FY 1990 budgets were being prepared, the 58 percent increase to $27.6M in the DOE human genome budget was viewed as being adequate to continue supporting DOE scientists to successfully develop the resources and technologies needed by the scientific community to characterize the human genome at the molecular level. The relatively large increase in the President's budget for NIH human genome research may translate into accelerated demands for the tools being developed by DOE. If such accelerated demands materialize, they will be considered in future Department budget requests. However, not all new technological applications require large amounts of funds as evidenced by the use of the scanning tunneling microscope to directly image DNA at LBL and LLNL.

Question: Because of DOE's tradition of undertaking large, multidisciplinary research projects, Dr. Hunter, don't you believe DOE has a major role to play in the human genome initiative?

Answer: DOE has in place a growing coordinated, multidisciplinary approach to developing the resources and technologies that are necessary to characterize the molecular nature of the human genome. This program like many others within DOE is carried mainly in the national laboratories, but also at universities and in the private sector. Three national laboratories, Los Alamos, Lawrence Berkeley and Lawrence Livermore, which are well managed and staffed are providing the major thrust for this focused research and development activity. The overall initiative is managed by experienced DOE headquarters staff assisted by a steering committee made up of leading scientists in genome-related research. This kind of team activity can and will provide the essential tools needed for the success of the human genome project.

Question: I would also like to direct two questions to both Dr. Hunter and Dr. Hecker. The two questions are: 1) what strengths do you believe DOE brings to the genome initiative?, and 2) what contributions do you believe DOE and its national laboratories will be able to make to the human genome initiative?

Answer: DOE has a long history of managing large multidisciplinary research projects which are carried out mainly at the national laboratories by coordinated teams of investigators. This is clearly a strength but more specifically, it is the interaction of the laboratories' scientists, engineers and mathematicians that is already accomplishing important breakthroughs in this area of research. The national laboratories are already making contributions to this national effort. The National Laboratory Gene Library Project which is a part of this Initiative at the Los Alamos and Lawrence Livermore National Laboratories has successfully provided the scientific community with collections of chromosome specific DNA clones and continues to construct even more desirable sets of such clones. This successful activity and the ongoing development of linearly-ordered sets of DNA clones specific for each chromosome require the coordinated interaction of biologists, physicists, engineers and computer scientists. Future contributions are anticipated in the areas of instrumentation development, automation and robotization; software development, and data analysis and management; and in biological resource development.

Dr. Hecker, Los Alamos National Laboratory

Answer: (1A) DOE is mounting an interdisciplinary, focused team approach that sets goals and milestones. It was first to propose the initiative as a national goal and first to fund work with this focused approach and interdisciplinary character. The very strong disciplines brought by DOE to this project are computational physics approaches to master the immense amounts of data which will be generated, special expertise in the national gene library and gene bank which are housed in DOE laboratories, very strong instrumentation ability including high speed laser based cell sorting, ultra sensitive high speed identification of molecules, an excellent track record with respect to advancing the state of the art of gene mapping, and the application of machine learning techniques to the genome project. DOE has a fine history of successfully bringing together multidisciplinary teams of physicists, chemists, computer scientists, engineers, and bioscientists to attack complex problems. These laboratories have first-class research equipment, incomparable computer facilities, and excellent research and support staffs. Of particular relevance to the human genome project, the national laboratories have conducted extensive research on human health consequences of both nuclear and nonnuclear energy technologies, including the consequences for human genetic material.

(1B) The DOE laboratories will contribute a great deal to the initiative: development of technology which will greatly speed up and reduce the cost of mapping and sequencing is especially suited to the labs and one on which we are focussing much of our effort; we have been charged with transferring this technology to industry and we are setting up partnerships with industry as an effective way to make the transfer; we are developing powerful computational tools to handle the data and to help analyze and interpret the data; and we have a very fine cadre of scientists who will lead in the developing science in the initiative

Question: A final question for Dr. Hecker is what contributions is the Los Alamos National Laboratory making to the human genome project?

Answer: At Los Alamos, there is a great sense of excitement and optimism amongst our scientists and techicians - the mood reminds our old-timers of the extraordinary days of the Manhattan project.

Scientists at Los Alamos in the last few months alone, have accomplished the following:

One. The discovery of a single repetitive DNA sequence that marks the two ends of every human chromosome. These are called telomeres. (Startlingly enough, the identical sequence appears to be found at the ends of the chromosomes of all vertebrates). We have developed specific fluorescent tags for this sequence and made this information public.

Two. Los Alamos scientists, in collaborations with Washington University, have been able to make copies, or clones, of very large DNA fragments that contain these telomeres, i.e., the ends, and they have done this for nearly every human chromosome. Those clones are being stored and made available for research in the whole community.

Three. It is likely that the DNA fragments, of which we now have many copies, contain the elusive Huntington's disease gene known to be near the telomere of Chromosome 4.

Four. We have invented a much faster technique for ordering those copies or clones. We completed over half of the physical map of Chromosome 16 by the end of April.

Five. We are collaborating with the University of Utah, to combine our detailed physical map with their high-resolution genetic-linkage map.

Six. And, we have applied a computer learning technique to detect significant patterns in DNA. This computer code now recognizes 100% of the sequences that code for proteins in a bacterium, and when applied to the human genome, it reliably identifies all sequences known to be genes. In addition, it nominates a large number of sequences that are not now known to code for proteins. These, of course, are immediately interesting sequences.

Seven. We expect to have our first formal industrial partnerships set up in a pilot center mode in the next few months.

Human Genome Initiative

Importance of DOE Leadership

Question: Could you explain the critical role technology development plays in the mapping of the human genome, and describe DOE's efforts in this regard?

Answer: The development of those technologies and resources needed to characterize the human genome at the molecular level is the aim of the DOE Human Genome Initiative. Advances in genome-related work are dependent upon cost-effective instrumentation that can be applied to the specific problem being addressed. To succeed in accomplishing the long-range goal of determining the sequence of the molecular subunits of human genomic DNA, new, innovative and cost effective DNA sequencing technology must be developed. The cost of determining the sequence of these 3 billion subunits needs to be reduced by factors of ten to one hundred before an intensive effort can be launched.

Question: Could you give some examples of advances in genome research generated by the DOE?

Answer: DOE supported investigators at the national laboratories, as well as universities and the private sector, are already making advances in this project which is only two years old. Two of the national laboratories, Los Alamos and Lawrence Livermore, have constructed chromosome specific collections (libraries) of DNA clones for each of the twenty four different human chromosomes and are now working on collections of larger clones that will be even more useful to scientists. Investigators at Los Alamos have recently characterized the molecular nature of the tips (telomeres) of the human chromosomes and are using this knowledge to construct physical maps of linearly ordered DNA clones for chromosome 16. A group at the Lawrence Livermore National Laboratory has modified and applied a DNA sequencer manufactured by Applied Systems, Inc. to mapping rather than sequencing. This instrument along with new software developed at the Laboratory is being used to construct a physical map of linearly ordered DNA clones of chromosome 19.

Geneticists at the Lawrence Berkeley Laboratory are using their knowledge of yeast genetics to develop special DNA vectors that can accommodate very large fragments of human DNA for cloning purposes. Interaction between the Lawrence Livermore and Lawrence Berkeley Laboratories has resulted in the direct imaging of unstained DNA by scanning tunneling microscopy. This is the first time anyone has directly visualized the genetic material the structure of which was hypothesized by Watson and Crick in the early 1950's.

Question: Given the leadership of DOE labs in technology development and multi-disciplinary research, should not the DOE be as much a leader in this effort as is the NIH?

Answer: The aim of the DOE Human Genome Initiative is to develop the resources and technologies needed to characterize the human genome at the molecular level. This is a relatively focused aim compared to that of the National Institutes of Health which has a much broader project that includes research on nonhuman systems and has large educational and ethical components. Because of the excellent management and scientific capabilities of the multidisciplinary national laboratories, DOE is already recognized as the leader in constructing physical chromosome maps with all the biology, chemistry, physics, engineering and computational science involved in achieving their successes to date. The national laboratories are positioned to lead in developing the instrumentation needed to cost-effectively determine the DNA sequence and the data management and analysis capabilities needed to manipulate the vast amount of new data anticipated from accelerated mapping and sequencing activities in the years ahead.

Coordination with NIH & Industry

Question: Do you believe we have the kind of coordinated leadership between DOE and the NIH that is necessary for mapping the human genome as quickly and efficiently as we can?

Answer: The two Federal agencies with human genome projects, the NIH and DOE have signed a Memorandum of Understanding to facilitate cooperation and coordination of genome research and related activities. This Memorandum establishes a joint advisory committee made up of leading scientists to provide broad overviews of science and policies and an interagency working group made up of staff of each agency to help coordinate research activities. Additional coordination is accomplished through informal meetings between representatives of the two major agencies, the NSF, and the Howard Hughes Medical Institute both of which support genome related research. In addition, NIH, NSF and Howard Hughes representatives are invited to attend the quarterly meetings of the DOE Human Genome Steering Committee and meetings of the NIH Human Genome Advisory Committee are attended by DOE and other interested agencies. The consensus opinion of the involved agencies is that the current mechanisms for coordination are adequate.

Question: Industry will play a very important role in seeing that the benefits of genome research are converted into useful products and treatments that will improve the quality of life. What are you doing to ensure that industry is involved in the development of the genome project?

Answer: When Energy Secretary Herrington named the Los Alamos National Laboratory and the Lawrence Berkeley Laboratory official Human Genome Centers he also charged them with the responsibility for facilitating technology transfer in this specialized area of research. While the national laboratories have been involved in transferring technology to the private sector in other research disciplines, such activities in the area of the biological sciences have been infrequent. However, Los Alamos convened a workshop with interested companies this past December to determine possible mutual interests and to begin developing a call for proposals aimed at establishing laboratory-industry relationships. This is a continuing activity. In addition, the Department's Small Business Innovative Research program has a human genome category which in the past year has awarded half a dozen Phase I and three Phase II projects.

Dr. James Watson's New Idea

Question: Recently Dr. James Watson, Director of the NIH Genome Project, suggested that we should "internationalize" the human genome project -- giving different nations a different chromosome to map. What do you think of this idea?

Answer: Soon after the Department began its Initiative, other Federal agencies, the private sector and universities in this country became interested in participating in one way or another. This interest has naturally developed in other countries as well, especially in Europe and Japan. But third world countries are also interested in some kind of involvement. So research activities around the world are beginning to include human genome-related efforts and the managers and leaders in the respective government agencies and scientific communities are contemplating strategies similar to those that have been used in this country. They plan to construct physical maps of the human chromosomes and then move on to sequencing the chromosomal DNA at a later date when more cost-effective technologies are available. These countries are also keenly interested in developing the needed instrumentation and computational capabilities.

This project is rapidly becoming internationalized without anyone's intervention with chromosome assignments. The concept of assigning chromosomes has not been well received by the scientific communities in this country or abroad.

Question: Were you consulted about the idea? Does it represent a coordinated NIH-DOE view about how we should proceed?

Answer: Dr. Watson first espoused the chromosome assignment idea during the recent DOE Human Genome Steering Committee meeting held in Bethesda on April 18, 1989. The idea was not received well at that meeting and it has met with much resistance since it has been more widely announced at other meetings and in Science magazine.

The seven chromosomes that are currently being mapped in the DOE project were selected and proposed by the respective principal investigators because of individual interests in one or more genes that are known to be located on each chromosome. The chromosomes were not assigned. Already, the three national laboratories most heavily involved in these activities are contemplating which chromosome to begin mapping next. Their decisions will be driven by scientific interests and research capabilities.

High-Temperature Superconductivity Pilot Centers

Mr. Chairman, I am pleased that the Subcommittee is receiving testimony from several directors of DOE's national laboratories. I certainly want to welcome them, and raise an issue that is of great importance to three of the four national laboratories represented here today. That issue is whether or not DOE intends to follow through on its commitment to establish three High Temperature Superconductivity Pilot Centers. These three centers would be at Los Alamos, Oak Ridge, and Argonne National Laboratories.

Mr. Chairman, it was only two short years ago that the major scientific story was the advancing frontier of high-temperature superconductivity. American scientists and scientific institutions led the world in these advances. However, this nation has to ask itself whether it will be the ultimate winner in utilizing these scientific advances in the commercial marketplace.

I will say again to my colleagues that where this nation loses its competitive edge is in its failure to quickly get its scientific and technological breakthroughs into products and into the marketplace. In recognition of this ongoing problem, in FY 1988, DOE established three superconductivity pilot centers to close this gap. The initial proposal is for $5 million in annual funding for each pilot center with additional resources to be put forward by private industry in these collaborative projects.

I am dismayed to find, Mr. Chairman, that the FY 1990 budget request for Systems and Materials Research under Electric Energy Systems is a flat $12.1 million. No new money has been added to the DOE budget since the inception of the pilot centers. DOE has, as I understand it, reprogrammed $800,000 in FY 1989 for each of these centers as start-up funding, but the FY 1990 budget request fails to follow through on this commitment.

Question: First, Mr. Chairman, I would like to ask Dr. Hunter, what DOE's intentions are with respect to funding the high-temperature superconductivity pilot centers?

Answer: The Department intends to continue to fund the high-temperature superconductivity pilot centers in FY 1990 at about the same level as in FY 1989, namely, $2 million per center. This level takes into consideration the resources available and the rate of progress being made.

Question: Does DOE intend to reprogram any additional funds to these centers in FY 1989? Does DOE's failure to request funding for this initiative in the FY 1990 budget mean it has shelved this effort? If so, why?

Answer: The Department does not intend to reprogram any additional funds to the centers in FY 1989 due to the fact that the present pace of signing agreements with industry is consistent with the budget. Any decision on reprogramming would be revisited if conditions change. The FY 1990 budget is considered to be adequate to continue this pilot effort.

High-Temperature Superconductivity Pilot Centers

QUESTION: Finally, I would like to ask each of the lab directors who are involved in this initiative, what consequences they foresee if the DOE delays, or shelves, this high-temperature superconductivity pilot center initiative?

Argonne National Laboratory

ANSWER: The Pilot Centers for the commercialization of the new high-temperature superconductors, even a their extremely modest initial funding level, have already proven highly successful in attracting U.S. industry into collaborative technology transfer relationships with the national laboratories. For several years, we have searched for effective ways and means to make the immense technological resource represented by these laboratories available to U.S. corporations in a usable and attractive form. The Pilot Center experiment is a breakthrough because it has removed administrative barriers and offers true competitive advantage to industrial partners. That the programs at all three Pilot Centers are oversubscribed attests to the correctness of the Pilot Center concept. As a new and rapidly developing emerging technology, high-temperature superconductivity is an ideal test bed for bold technology transfer initiatives. The flexibility and readiness of corporate America to do business in a new and imaginative ways is maximal in this circumstance, just as it was in the 50's and 60's in the then young semiconductor industry. Thus, a window of acceptance toward a new relationship with the federal technology establishment is open now and bodes well for our ability to significantly impact the international competitiveness posture of the U.S.

Delay or derailing of the Pilot Center initiative would send the wrong message to U.S. industry and would confirm to our competitors overseas that our government has yet to find a robust and viable way to infuse federally created technology into the market place. Without strong congressional and agency support of the Centers, we can expect a disaffection on the part of those forward-looking corporations who have begun collaborative programs with the Pilot Centers and our ability to extend the Pilot Center concept to commercialization of a far wider range of technologies would be severely eroded.

Oak Ridge National Laboratory

Answer: Any delay or decrease in support in the superconductivity pilot center project would significantly retard the progress we have made with U.S. industry toward commercializing the new high transition temperature superconducting materials, and seriously erode the confidence industry has in the abilities of the National Laboratories to consummate and follow through on cooperative R & D agreements. At the present time the ORNL pilot center has signed cooperative or proprietary work agreements with four industrials partners, is in final negotiation with eight others, and has significant interest from at least 25 additional firms. The current funds will allow only six additional agreements.

The response from industry to the Pilot Center initiative has greatly exceed expectations. This is partly due to the exciting potential for this technology and partly a result of the streamlined business and legal interactions the DOE has established for the Pilot Centers in negotiating agreements with industry. Any delay or cancellation at this stag would seriously undermine this progress and retard our chances for rapid development of this technology. If anything, now is the time to stimulate the Pilot Center initiatives with additional funds to insure participation by other interested industries.

Los Alamos National Laboratory

Answer: The Superconductivity Pilot Centers represent a novel approach for the DOE laboratories to contribute to

U.S. competitiveness. High-temperature superconductivity is a perfect test case for this novel experiment of having the DOE work jointly with U.S. industry to develop technologies of strategic importance to our nation.

The concept of the pilot centers was developed carefully and systematically over 14 months with widespread industry participation. Private industry interest has been overwhelming. Early DOE cooperation in finding ways to expedite the typically cumbersome contracting and intellectual property issues was excellent. If DOE delays or shelves the Superconductor Pilot Center initiative we see the following as possible consequences:

1. The nation loses one of the few programs that is aimed directly at the challenge of how to translate the scientific breakthrough of superconducting at relatively high temperatures to applications. The focus of these Centers is to develop generic, precommercial technologies jointly with U.S. industry. This would allow U.S. companies to compete more effectively with Japan where such collaboration is already in high gear. The concept embodied in the Pilot Centers is almost identical to the recommendation to set up consortia made by the Committee to Advise the President on Superconductivity (the so-called Wise Men Committee).

2. The DOE will lose the best vehicle that it has to leverage decades of superconductivity research at its laboratories into civilian and defense applications.

3. The DOE will lose the confidence of U.S. industry which is looking at this initiative as the test case for DOE labs--industry interactions. American companies have told us repeatedly that they doubt the Department's commitment and ability to work closely with them on technologies that matter to U.S. competitiveness. Nothing less than the DOE's reputation in working with industry is at stake.

4. Since the Pilot Center experiment is as much an experiment in attempting to expedite and clean up the DOE-business interface as it is a technical one, we believe that the entire DOE technology transfer process will suffer. If the initiative is slowed or shelved, then many of the hard fought gains in contracting and intellectual property rights procedures made early in this program will be lost to the detriment of all technology transfer efforts.

In addition to a specific delay or termination of the Superconductivity Pilot Center initiative we are concerned about the current state of the initiative which can be described better by relative inattention. After initial enthusiasm by DOE, interest in recent months has waned and the initial funding request has never been supported. This leaves the laboratories in a terribly awkward position in working with industry where enthusiasm for this initiative is extraordinarily high.

For this initiative to succeed we need the enthusiastic support of DOE and the initial request of $5M per Center per year, plus modest capital and construction funds.

Nuclear Physics -- Large Cherenkov Detector

Mr. Chairman, I know this Subcommittee will face the decision of whether or not to proceed with the actual construction of the Superconducting Supercollider, which is a major initiative for nuclear physics. The SSC is big science -- as is NASA's space station -- and these will be difficult decisions for the Appropriations Committees and the Congress to make.

However, Mr. Chairman, we should not lose sight of the major science that the nation is poised to do with smaller science projects -- projects that build on facilities that are already doing leading science. One such project is a proposed Large Cherenkov Detector, or LCD, which Dr. Hecker discussed in his statement.

The Large Cherenkov Detector is a neutrino detector that will be able to precisely measure our current "standard model" of how the universe works. The LCD is extremely important to physics because it will allow us to study one of the crucial parameters of the standard model.

A capital expenditure of an estimated $40 million over several years would be needed for the equipment to develop the LCD. The detector would be used in conjunction with the Los Alamos Meson Physics Facility and its Proton Storage Ring to produce neutrinos of sufficient quantity and characteristics to make accurate measurements of neutrino properties, which are of great importance in developing and testing the present models of the physical world.

I would argue, Mr. Chairman, that this type of science is as central to the basic questions of physics as the SSC. I would also express my concern that if the nation embarks on the SSC, we realize that there are base programs in physics that must continue.

Question: My first question, Mr. Chairman, is how the Department plans to retain the vitality of the Nuclear Physics program during the period of SSC construction, if that project is constructed, considering that budget constraints will continue to be the order of the day?

Answer: The Administration's position has consistently been that implementation of the SSC project will not adversely affect other science activities. As proposed in the Administration's document entitled Building a Better America, the Administration has projected approximately ten percent growth for basic science including the National Science Foundation and the Department of Energy's high energy and nuclear physics programs, except for the SSC. Accordingly, we are committed to maintaining the vitality of the Nuclear Physics program during SSC construction.

Question: Dr. Hunter, has DOE reviewed the proposal to develop the Large Cherenkov Detector, and if so, what is its evaluation of the value of this project?

Answer: DOE, assisted by a panel of scientists in early 1988, evaluated the Large Cherenkov Detector (LCD) and its associated physics experiment to determine the scientific need and technical feasibility. The conclusion of that evaluation was that the LCD experiment, in conjunction with complementary measurements, will provide a very significant test of the Standard Model and could indicate important new physics. A subsequent design and cost evaluation by DOE was satisfactory.

In January 1989, the LCD proposal--and two other proposals for large equipment items--were referred to the DOE/NSF Nuclear Science Advisory Committee (NSAC) for an evaluation of the absolute and relative scientific benefits of the proposed projects. NSAC's recommendation on LCD was: "...despite the substantial scientific merit of LCD, because of its large price tag and the long-term nature of this program and thus its impact on funding for nuclear physics, NSAC cannot recommend funding of LCD from the ongoing Nuclear Physics program."

Question: As I understand it, the LCD would provide crucial information for the understanding of the standard model, which attempts to explain the various forces of nature. Is there a better time, or more cost-effective way to attain this information and do this experiment?

Answer: The dominant purpose of this proposal, and the one which drives the design, is a significant test of the standard model of the electro-weak interaction which would improve on the accuracy of other experiments by about a factor of 3 to 5. The detector would utilize the properties of the LAMPF and PSR facility, especially its pulsed beam characteristics. It thus appears that the combination of LCD and LAMPF/PSR presents a unique physics opportunity.

Question: Could you assess the importance of the proposed LCD to research on the next generation of proton accelerators, for example, the Advanced Hadron Facility?

Answer: To the extent that any experimental result helps fix the design of subsequent facilities and provide indicated directions to the experimental program, there is a tenuous connection. However, it is difficult to identify any more specific potential coupling that is peculiar to the LCD proposal.

Question: The Los Alamos Meson Physics Facility is the largest nuclear physics user facility in the world today. Research there has led to 10 to 20 percent of the PhD degrees in nuclear physics for the past ten years. Wouldn't the Large Cherenkov Detector enhance the vitality of this facility? Wouldn't it serve to attract additional PhD candidates to this research area?

Answer: LCD would provide a major new capability at LAMPF and offers a good probability of yielding important physics results. The overall impact on LAMPF as a user facility is more difficult to assess since LCD would clearly require significant sacrifices in other parts of the program for at least the six or seven years required to build the apparatus and carry out the first experiment. It may be true that an ultimate exciting result would attract new students by adding to the general luster of nuclear physics research, but the LCD project itself would be inappropriate for any major student involvement.

Question: As I understand the LCD, it would be run in conjunction with the Los Alamos Neutron Scattering Center, or LANSCE, as a bridge, if you wish, to the Advanced Hadron Facility. Could you explain to the Subcommittee how the Advanced Hadron Facility would enhance the nation's research capability as the next generation of accelerator beyond LAMPF, the Continuous Electron Beam Accelerator Facility (CEBAF), and the Relativistic Heavy Ion Collider (RHIC)?

Answer: It appears that the question of the Advanced Hadron Facility at the LAMPF site is now a moot one since LAMPF managers have stated publicly that such a facility is no longer in their thinking. At present, Los Alamos is in the process of developing other ideas for proposed upgrade of the LAMPF facility.

On the general question of an Advanced Hadron Facility, it is not clear what the implications of such a facility are for the Nuclear Physics program since much of the research identified for such a facility is presently in the domain of particle physics research, which is funded under the High Energy Physics program.

Global Climate Change

Question: I am most pleased to see the President make a commitment to increased research into global climate change in his FY 1990 budget request. As the chart shows, the budget request totals $190.5 million for seven federal departments and agencies to address the phenomenon known as global change. The request represents a $56.6 million, or 42 percent, increase over the FY 1989 funding level for such activities. Support for this request will allow us to proceed with the initial strategy for a comprehensive long-term global change research program outlined in "Our Changing Planet: A U.S. Strategy for Global Change Research," which accompanied the budget request.

Table 1 on pages 24 and 25 of the "Changing Planet" report outlines the proposed global change budget program by agency and science element.

Question: Would you please provide for the record a detailed breakdown, by program account, and amount what these funds would be used for, if appropriated?

(The information follows:)

Breakdown by Program Account
(Dollars in Millions)

Biological and Environmental Research	$26.0
CO2 and Climate Research	$22.1
Atmospheric Sciences	1.9
Theoretical Ecology	2.0
Basic Energy Sciences	1.2
Geosciences	1.2
Total DOE Budget for Global Change Research	$27.2

The prospect of global climate change which could change our lives is potentially very serious. Potential impact on energy use could be immense; therefore, it is imperative that actions are based on sound scientific information. The DOE program is modest in scope, but clearly seeks to understand the cause and effect relationships between energy emissions and climate. In particular, measurements will be initiated on the quantitative link between rise of greenhouse gases and change in atmospheric or climate properties. Carbon dioxide and climate research will focus attention on global sources and sinks of CO2. Data acquisition and modeling will begin to analyze rates of change in the exchange of CO2 and heat between atmosphere and ocean. Computer capability will be expanded for diagnostic climate analysis and for testing global climate models.

Atmospheric research will focus on precipitation chemistry, and the effect of sulfate aerosols on cloudiness and radiative balance.

Research on theoretical ecology will strengthen and expand the theoretical underpinning for analysis of global change.

Geosciences research will begin research on quantitative understanding of energy related earth processes.

Question: Would you also provide a brief summary of the questions the research supported in this initiative would address, and how it would advance our understanding of the potential impacts of global change?

Answer: The many facets of global change occur over long time periods, and involve many atmospheric, oceanic and land processes. Climate change is an important concern, and detection of change requires systematic and long-term observations. An important DOE role is to conduct research on CO2 and other emissions from energy, to determine the sensitivity of climate and vegetation to changing concentrations of atmospheric gases. The research:

- o investigates how the earth's natural biogeochemical system can accommodate excess CO2 and methane from energy sources;

- o analyzes climatological data to detect global warming; new measurements are being explored which will quantitatively link change of atmospheric and climatic properties to the greenhouse gases;
- o is looking for ways to improve the general circulation models that are used to predict global and regional climate change;
- o is examining the combined effects of increased greenhouse gases and climate change on vegetation.

This research enhances understanding of global processes in terms of:

- o determining rate of change of atmospheric CO2; this information is important for related estimates of rate of climate change, and for identifying energy response strategies, if such actions are deemed necessary;
- o establishing quantitative cause and effect relationships between atmospheric change of greenhouse gases and the global and regional climate responses;
- o determining how representative ecological systems (and the global life-support system) may be modified directly by rising atmospheric CO2 and indirectly by climate change.

While this research focuses on global problems of crucial interest to energy, the studies often rely on cooperative arrangements with other institutions and agencies.

Question: How does your department/agency propose to coordinate its research efforts under this strategy with the ongoing work of the other federal entities involved in this initiative?

Answer: During the past year DOE has joined the interagency effort to develop a research strategy for global change, and research plans are being incorporated in the interagency planning process of the Committee on Earth Sciences (CES). DOE will have an important part in the research on biogeochemical dynamics, ecological systems and climate and hydrologic systems. Initiatives include support for carbon measurements of the Global Ocean Flux Study, for climate observations and analysis to quantitatively link radiative and climate change to greenhouse gas concentrations, and for enhanced research in theoretical ecology to underpin experimental, modeling and ecological systems in global change. The Department will continue to work cooperatively with the CES in the implementation phase of the U.S. Global Change Program. There are effective interagency agreements between DOE and other agencies (NSF, USDA). The Department also works closely with National Academy of Sciences' Boards and Committees.

QUESTIONS SUBMITTED BY SENATOR QUENTIN N. BURDICK

Miles City DC Tie

Question. As a long-time advocate of regional economic development and inter-regional cooperation, I have supported Federal development of the river basin systems in the western United States. The role the Federal Power Marketing Administrations (PMA's) play is a very important one because they have a tremendous positive impact on economic growth in this region. I have supported the public policies and appropriations necessary to further these economic goals. This development has led to wise use of our natural resources including our land, water and energy resources. In these very difficult economic times and with the tremendous pressures to reduce federal expenditures, I believe we should accelerate cooperative efforts between PMAs because it will maximize the benefits from the Federal investments in the hydroelectric generating and transmission facilities that are already in existence.

As you know from our previous discussions, Mr. Jura, I have a particular interest in the investments made in the 1980s when the Western Area Power Administration (Western) received an appropriation to construct the Miles City DC Tie in Montana. This tie connected the eastern and western transmission grids so power could be transmitted between the eastern and western United States.

Some years have passed since this appropriation was made, but it was my understanding based on testimony before the Appropriations Committee that Western would be using this facility to transmit power to northern California to meet load requirements of their customers in that area for a twenty-year period. The Bonneville Power Administration also made investments in transmission facilities at that time which provided for delivery of this power. I am particularly disappointed that Western was not able to secure the long-term contract it needed to wheel the 185 megawatts of power from the Dakotas to northern California. In fact, the Western and Bonneville agreement was only a five-year contract which expires in October of 1990.

I want your assurance that the transmission path will be preserved after the contract expires so deliveries can be made from the eastern inter-connected transmission system. Maintaining this inter-connection will also allow diversity exchanges between the regions because of the different time zones to areas of need in Washington, Oregon, and California. This is important to me because Western has received appropriations from this Committee and has made investments in the DC Tie which need to be repaid.

I am also requesting the Administrators of Bonneville and Western develop a plan to accomplish the objectives listed above and provide the plan to the Committee by July 1, 1989. I am sending a copy of these questions to Mr William Claggett, Administrator of the Western Area Power Administration so he is aware of the Commission's request for this plan.

Answer. There is a good deal of history about the issue regarding the Miles City DC Converter station. The subject was discussed during the FY 1988 Senate Energy and Water Development Appropriations budget hearing. The subject also came up during the House Energy and Water Development FY 1990 Budget Hearing on March 15, 1989. At that hearing, Mrs. Smith asked a question very similar to the question you raised. We also recently met and discussed this matter with the Western Area Power Administration and Basin Electric on May 23, 1989.

In our answer to Mrs. Smith's questions during our FY 1990 Budget Hearing, we provided the following information.

(The information follows:)

> Mrs. Smith. In the early 1980's, this Committee appropriated about $30 million to Western to construct the Miles City DC Tie near Miles City, Montana. The appropriation for the tie was intended in part to better utilize the natural resources of the Missouri Basin and the Pacific Northwest by providing an avenue to move electric power generation--especially surpluses--between the eastern and western U.S.
>
> Testimony before this Committee indicated that the vast coal resources in the Missouri Basin could be utilized to supply energy to areas such as northern California, which would help Western in meeting load requirements in that area.
>
> I am told that after this Committee appropriated the money to construct that tie, Bonneville reneged on an agreement to sign a long-term contract with Western to wheel 185 megawatts of power from the Dakotas to northern California. Western and Bonneville negotiated only a five-year contract, which terminates in October 1990.
>
> My concern is that rural electric cooperatives in my district pay power rates that assist in paying for electric generation in North Dakota, which has large surpluses of coal-fired electricity that could be made available in northern California, Washington, and Oregon. These surplus sales would help lower the cost to consumers in my district, would be a good utilization of the natural resources in the western U.S., and would help preserve the investments made by the federal government in transmission facilities operated by Western and Bonneville.
>
> Mr. Jura, what are your plans for the existing transmission path for the 185 megawatts after October of 1990? What happens to the large investment that Western made in the DC Tie station? What happens to the investment made by Bonneville to provide the 185 megawatts of transmission capacity available from Montana to the Bonneville system?
>
> Mr. Jura. There is a substantial amount of history behind the issue of the Miles City DC Converter Station. The subject was discussed at length during the FY 1988 Senate Energy and Water Development Appropriations budget hearing. I would like to insert for the record information that was jointly prepared

by Bonneville and the Western Area Power Administration at that time.

(The information follows:)

> We in the Western Area Power Administration (Western) and the Basin Electric Power Cooperative (Basin) began negotiations for the sale of power in mid-1981. Basin was projecting system surplus power with the construction of its Antelope Valley Station coal-fired Unit 1 in 1985 and Unit 2 in 1986. Under this agreement, which was signed in April 1982, Basin would provide 185 megawatts of power from Antelope Valley Station at the Miles City, Montana DC Converter Station. Deliveries of power began in 1986 and continue through October 1990. When the contract was being negotiated, Basin's load growth projections indicated that it needed Antelope Valley Station power for its own load after 1990. However, the parties provided for the contract to continue if neither party gave written notice of termination to the other by October 1989. A letter agreement which supplemented the Basin contract was executed in December 1985. It provided for the start of deliveries in January 1986, and the deferral of deliveries from Antelope Valley Station Unit 3.
>
> Antelope Valley Station power is wheeled from the Miles City Converter Station through the Montana Power Company's system, onto the Montana Intertie (Colstrip lines) to the eastern grid on Bonneville Power Administration's (Bonneville's) system. Wheeling through Bonneville's system to Western's system at the California-Oregon border is pursuant to a contract between Bonneville and Western which terminates October 31, 1990. Under terms of that contract, Bonneville has the right to interrupt Antelope Valley Station power deliveries when the exportable contract is in place. That is, when the amount of Northwest surplus energy available for export exceeds the amount of Intertie capability, typically during the spring runoff and during above-normal rainfall periods, Antelope Valley Station power deliveries are curtailed, but Basin still receives a monthly payment for capacity. Under the letter agreement, such payments for capacity will accrue for credit on deliveries of power in 1990, the last year of the contracts.
>
> While the Miles City Converter Station is obviously important for delivery of Antelope Valley Station power to California, the benefits from this facility are not restricted to the Basin-Western power delivery contract. The original justification for this facility, presented to the Congress in early 1981 in the FY 1982 budget request focused on the system efficiency and reliability benefits of an East-West Intertie in Montana.

The Miles City Converter Station Environmental Evaluation Report, completed in the Spring of 1982, describes the following benefits from that investment. I would like to insert a list of those benefits for the record.

Miles City Converter Station Benefits

1. Mutual assistance between the eastern and western power networks during emergencies.

2. Ability to take advantage of load diversity between the Western and Central Regions.

3. Economy energy exchanges.

4. Opportunities for oil conservation by transferring projected excess coal-fired generation from the central region of the United States to the Western United States where oil-fired generation is required to meet firm load obligations.

5. Increased system reliability.

6. Reserve sharing.

7. Restoration of system operating flexibility.

In the late 1960's through the early 1970's attempts were made to operate the eastern and western United States transmission systems as a single synchronized transmission system. These attempts were unsuccessful. Prior to Miles City, there was only one small intertie connecting the transmission grid in the eastern United States to the grid in the western United States.

The Miles City Station has proved to be an excellent tool for balancing energy supplies between the east and west transmission grids by providing transfer capability for short-term energy exchanges and greater diversity benefits. As a result, the overall efficiency of the Federal power system has been improved. In addition, this load/resource balance is achieved without the need for inconvenient system configurations, thereby providing increased system reliability. The Miles City Converter Station also relieved major operating problems in the local area, and can be used to provide mutual assistance during emergencies. These benefits from the station will continue after 1990, regardless of the status of long-term arrangements for wheeling Basin's power across Bonneville's transmission system.

Intertie Access Policy

Bonneville believes that the Memorandum of Understanding executed between the Western Area Power Administration (Western) and Bonneville Power Administration (Bonneville) in early 1984 provides sufficient transmission for Western to satisfy its contractual obligations with Basin Electric Power Cooperative. These obligations continue until the end of October 1990. Bonneville's proposed Long-term Intertie Access Policy (scheduled to be finalized this fall) grants firm access to Basin Electric Power through October 1990.

In 1981, Western began discussing a potential long-term power purchase from Basin in North Dakota to serve Western's loads in northern and central California. Western also began discussions with Bonneville concerning the transmission of such a purchase over Bonneville's transmission system. Given Bonneville's forecasts of deficit conditions in the Pacific Northwest for the foreseeable future, understandings developed between the two Federal Agencies that Western would have access to Bonneville's transmission system to effectuate a power purchase from Basin. On April 15, 1982, Western executed a contract with Basin for 185 MW of power. This contract obligated Western to "take or pay" for this power through October 1990. Thereafter, Western had no obligations to continue the transaction. Western's obligation was also contingent upon access to transmission facilities. Some of these transmission facilities, including those of Bonneville and the Montana Power Company, had yet to be completed.

Soon thereafter, Pacific Northwest electric demand forecasts changed radically. In July 1982, Bonneville issued its first official forecast showing the availability of surplus power from Bonneville. Other Northwest utilities also began to show surpluses. This surplus power needed access over Bonneville's transmission system to Southwest markets. Consequently, Bonneville faced an unexpected situation in which its own financial needs to market its surplus power to California and the similar needs of other Pacific Northwest utilities began to compete with Western's expectations of long-term access to the Southwest over the limited capacity of Bonneville's Pacific Northwest-Pacific Southwest Intertie facilities.

Nevertheless, Bonneville offered for public comment a proposed long-term memorandum of understanding between the two Federal agencies which would have provided Western with a 20-year transmission right over Bonneville's system and a 20-year sale of surplus Bonneville power. The comments received by Bonneville from Pacific Northwest utilities, public interest groups, and government agencies were highly critical of the proposed 20-year transmission commitment to Western. Senator Baucus of Montana, the Washington Utilities and Transportation Commission, the Montana Public Service Commission, the Idaho Public Utilities Commission, and the Public Utility Commission of Oregon were among those who asked Bonneville to reconsider the transaction. One of the major themes of this criticism was that Bonneville should not commit Pacific Northwest-Pacific Southwest Intertie capacity to a sale of power from North Dakota when that capacity was needed to transmit Northwest surplus to the Southwest. Commenters argued that Western could purchase less expensive power from the Northwest than from Basin, and that Bonneville had no obligation to provide any transmission to Western, particularly given the fact that the Basin-Western transaction was contingent upon access to completed transmission facilities.

Bonneville gave serious consideration to the expectations of Western, the legitimate concerns of the Northwest, as well as to Bonneville's own obligation to market its power and repay the Treasury. Further negotiations ensued with Western towards a revised transaction which would provide some benefits to all concerned. On February 7, 1984, Bonneville released its Decision Record on the transaction with Western. I would like to insert a portion of this for the record.

BPA Decision Record

> Western, a Federal power marketing agency of the United States, purchased power from Basin Electric after seeking such a purchase from the utilities in the Pacific Northwest and, at that time, with the understanding that transmission would be made available using the FCRTS (Federal Columbia River Transmission System) to serve its customers in northern California. Under the contract, Western agreed to purchase from Basin Electric a 185 MW share of the Antelope Valley generating resource with some obligation to pay a share of costs even if Western does not take delivery of power. A significant obligation of the United States could be created if Intertie transmission is not provided for this power. We have determined that BPA, as owner and manager of the Intertie, should provide Western transmission to cover the 5-year period that Western is obliged to take the Basin Electric power. This 5-year period reflects a reduction in both the scope and terms of earlier drafts of the MOU, and still allows BPA to effectuate a commitment made by the United States Government (through Western) during good faith negotiations between Western and Basin Electric.

This document also contains the following statement:

> BPA has negotiated this MOU with Western to meet both BPA's and Western's near term needs. The MOU reflects a compromise on issues by both parties. BPA and Western expect to consider elements of a long-term arrangement upon completion of the IAP (Intertie Access Policy), and subject to the IAP, as a follow-up phase to the proposed MOU. Such elements may include (1) the arrangements and term of a negotiated agreement for the renewal or replacement of Western's 5-year contract with Basin; (2) the conditions, terms, amount, and transmission rights for Western should it choose to purchase Pacific Northwest non-Federal resources; and (3) the conditions, terms, amount and transmission rights available to Western for any purchases it may negotiate for BPA power.

Thus, this very difficult issue was resolved by meeting the near-term needs of Western and Basin while also retaining flexibility for Bonneville in the face of the new energy realities in the Pacific Northwest.

Though Western can rely on access to Bonneville's transmission system only until 1990 to wheel Basin power, we do not agree that the Federal investment in the Miles City Converter Station will become worthless. Western's Environmental Evaluation Report on the Miles City Converter Station lists benefits which Mr. Clagett has elaborated.

The Report explains that attempts had been made throughout the 1960's and 1970's to interconnect the eastern and western transmission systems in Montana, South Dakota, Wyoming, Nebraska, and Colorado. These early attempts, which occurred long before the Basin-Western agreement, recognized that many benefits, other than wheeling power to northern California, would accrue from such an interconnection.

We also believe that the investment in the Federal share of the Colstrip transmission lines will not become worthless if Western is unable to wheel Basin power to California after 1990. That share will continue to be available for transactions, such as power exchanges and economy energy sales, between the Northwest and areas to the east.

Mr. Jura. BPA has been having discussions for over nine months with various interested parties regarding a follow-on contract with Basin. For over three months, BPA and Basin have been negotiating a long-term arrangement for the use of the Eastern Intertie after the expiration in October 1990 of Basin's current sale to WAPA (CVP). Several options are being explored: interregional exchanges, storage, nonfirm transactions, and Basin sales to the PNW or PSW.

To provide a little background, BPA's Interim Intertie Access Policy and Near-Term Intertie Access Policy which were in effect from September 1984 through May 16, 1988, did not provide for assured transmission access for long-term contracts outside the region for either Pacific Northwest regional or extraregional utilities. Had BPA's May 17, 1988, Long-Term Intertie Access Policy continued with that restriction, BPA and Basin could not be negotiating a new arrangement. However, the Long-Term Intertie Access Policy contains a provision which allows assured transmission access for qualified extraregional resources. Basin's resource is a qualified extraregional resource as defined in the Policy. Section 6 of the Policy provides extraregional utilities the opportunity to receive firm transmission access for qualified resources over the Federal portion of the Pacific Northwest-Pacific Southwest Intertie. A contract entered into under section 6 of the Policy must include "benefits to BPA such as increased storage, improved system coordination or operation, or other consideration of value commensurate with the services provided." The extraregional utility must also provide BPA with mitigation as described in section 4(d) of the Policy. It is only because of section 6 that BPA and Basin can negotiate a new contract for firm transmission on the Intertie. Section 6 also provides an opportunity for

Basin to gain nonfirm access at times when the capacity of the Intertie exceeds the requirements of regional utilities.

The focus of our discussions with Basin has been a joint BPA-Basin long-term sale to a California utility. This type of transaction is viewed as the most commercially viable and potentially profitable of the alternatives mentioned earlier. Under this arrangement, BPA would provide capacity during periods of peak use in California--generally between 10:00 a.m. and 6:00 p.m.--and Basin would provide firm energy during periods of moderate use--generally between 7:00 a.m. and 10:00 a.m. and between 6:00 p.m. and 11:00 p.m. BPA would wheel Basin's energy to the California utility. BPA would have the right to interrupt Basin's firm energy deliveries to California with nonfirm energy during Conditions 1 and 2 of the Long-Term Intertie Access Policy, during spill periods and when supply exceeds intertie capacity. Basin would provide energy associated with BPA capacity deliveries to BPA during nighttime hours--between 11:00 p.m. and 7:00 a.m. This arrangement would be subject to BPA's Long-Term Intertie Access Policy which governs access to BPA's PNW-PSW Intertie as it applies to access for extraregional utilities.

The discussions between BPA and Basin have also been attended by representatives of WAPA. Both Basin and BPA have put forth prices for their respective contributions to the package. BPA has included its standard published prices for capacity, nonfirm energy, and wheeling to California. The wheeling arrangements for Basin energy will be structured so as to minimize costs to Basin, while adhering to the same wheeling principles that BPA's PNW customers must follow.

The next step is for Basin to conclude its pricing proposals. Once this is accomplished, BPA and Basin will begin presenting the joint package to California utilities. We could begin this as early as in a month or two.

To the extent this or another arrangement exceeding 100 MW into the Pacific Northwest or California is successfully completed by Basin, the costs associated with Western's investment in the Miles City DC Converter Station would be further offset by the resulting wheeling revenues. BPA understands that Basin already pays the costs for 100 MW of east-to-west capability in the Miles City DC Converter Station.

BPA is also studying other potential uses of this transmission path after October 1990. We are identifying alternatives that appear feasible in light of our expected future resource needs and the transmission facilities necessary to move electric power from resource to load.

Hopefully, BPA will be successful in completing commercial arrangements whose revenues will cover the continuing costs of its investment. To the extent arrangements are successfully completed, the costs associated with this investment would be offset by the resulting revenues. If that were not to happen, these costs will increase the revenue requirement to be covered by BPA's power and transmission rates charged to BPA customers.

Mrs. Smith. Mr. Jura, will you give me your assurance that the 185 megawatt transmission path will be preserved beyond October of 1990 if power surpluses, which could be used to serve northern California, Oregon, and Washington, exist east of the Miles City DC Tie in the future?

Mr. Jura. In accordance with our answer above, BPA and Basin are currently negotiating a long-term arrangement for use of the Eastern Intertie after October 1990. Given the dynamic and unpredictable nature of contract negotiations, BPA cannot guarantee that a mutually acceptable arrangement will be reached but we are working very diligently to reach an agreement. BPA's negotiated contractual rights for the 185 MW transmission path are from Broadview Substation to BPA's own transmission system. The transmission path east of Broadview to Miles City is controlled by Montana Power Company and Western. The transaction we are currently negotiating with Basin, or any transaction we would negotiate with another utility east of the Miles City DC Converter Station, will be dependent upon successfully obtaining transmission rights over Montana and Western Systems from Miles City to Broadview.

BPA acquired the 185 MW rights between its system and Broadview because of the expectation that needs would develop for a transmission interconnection with transmission systems to the east. It was not only to provide for the current commercial arrangement involving Western Area Power Administration; however, at the time, that was the only immediate specifically identified need. BPA's rights for the 185 MW access to Broadview do not expire until December 31, 2004.

BPA-Basin Negotiations

BPA and Basin have been negotiating, since January 1989, a long-term arrangement for the use of the Eastern Intertie after the expiration in October 1990 of Basin's current sale to WAPA (CVP). On May 23, 1989, BPA met with Western and Basin to discuss options for providing transmission access to Basin over Western's system, Montana Power Company's (Montana Power) system, and Bonneville's transmission system. At that meeting, Basin presented the various options they are seeking in marketing to either Northwest utilities or to California over the Southern Intertie. To assist Basin in assessing their options, BPA provided estimates of the net revenues Basin could expect to receive from these markets as well as a summary of our current load/resource situation regarding energy and capacity.

In our discussions, BPA also provided Basin with 3 possible options. The alternatives included a Basin sale to a Northwest utility, a BPA/Basin joint venture involving sales to both Northwest and California utilities, and a BPA/Basin joint venture to California. These options all require that Western and BPA find some means of satisfying the needs of Montana Power.

BPA also identified its transmission needs over the Miles City DC Tie and the eastern and western transmission systems in Montana, to increase the efficiency of operating the Federal Columbia River Power System.

In order to pursue these options, several contracts will need to be researched and negotiated. Among the contracts to be developed will be (1) a joint venture contract between BPA and Basin, (2) a transmission contract for the requesting Northwest utility, (3) an arrangement between BPA/Western and Montana Power to wheel power (based on an upgrade of transmission facilities in western Montana in exchange for a 200 MW general path over Montana Power's system in eastern Montana), (4) a BPA/Western wheeling agreement providing BPA with guaranteed access to Miles City and excess capacity access on Western's system, and (5) Basin/Purchaser contracts.

At the May 23 meeting, all parties agreed to continue discussions and jointly develop a schedule for the above activities based on an end of the calendar year deadline for substantive discussions. In the coming months, BPA expects to be meeting with potential purchasers in California as well as with Montana Power concerning transmission issues.

SUBCOMMITTEE RECESS

Senator **Johnston**. The subcommittee will stand in recess subject to call.

Thank you very much, gentlemen.

[Whereupon, at 3:55 p.m., Thursday, May 18, the subcommittee was recessed to reconvene subject to the call of the Chair.]

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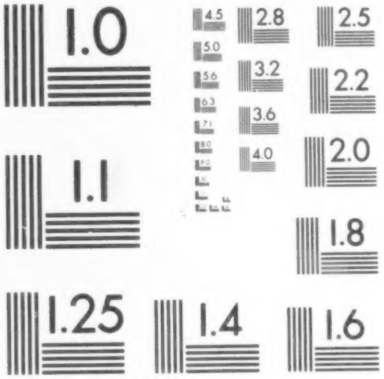
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